

## **Unit Cover**

### **Unit Title**

Mass Production, Marketing, and Consumption in the Roaring Twenties

### **Spine**

Mass Production, Marketing, and Consumption in the Roaring Twenties

### **Grade**

11

### **Discipline**

History-Social Science

### **Standard Number**

11.5.7

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## Overview Spread

### Overview

The “Roaring Twenties” is commonly portrayed as an era in U.S. history marked by great prosperity, and for most Americans indeed, it was. Large numbers of people had access to fabulous new inventions, bringing changes in lifestyle that we find familiar and often take for granted in the twenty-first century. However, with changes come consequences—some intended and foreseeable, others surprising and unwelcome. From this laissez-faire era with little government regulation came unbridled growth with both long-term as well as immediate effects on people and on the environment in which they lived.

In this unit, students explore this fascinating era to understand the dynamics of economic change and its social, political, and environmental consequences. Students learn about and see the patterns of these changes and consequences through the ongoing development and use of a graphic organizer displaying the rise of mass production and consumption in the 1920s.

The first lesson uses a reading about the Tracy Tire Fire of 1998-2000 to introduce students to the concept of “unintended consequences.” While there were some concerns expressed, people did not know how to safely dispose of the waste and byproducts generated by the automobile and other new technologies developed in the 1920s. Subsequent lessons introduce students to the 1920s as a time of social, political, and economic change influenced by preceding events and available natural resources.

In Lessons 2 and 3, students explore the rise of mass production and consumption. Made possible by scientific and technological developments arising before and during World War I, automobiles, electrical appliances, and other industrial products arrived on the market. Lesson 3 examines how manufacturers marketed these mass-produced technologies to Americans in ways never before seen, including the introduction of credit. Successful marketing fueled demand, driving development of other new technologies and drawing increasingly upon the supply of natural resources.

In Lesson 4, students learn that the development of, demand for, and use of these innovations from the 1920s both directly and indirectly influenced the country’s human communities and natural systems. From the designation of the first official landfills to the effects of oil and coal exploration, students explore ways in which the technological advancements and the prosperity that followed World War I changed the environment. They also examine the environmental consequences of decisions made—and not made—by industry, government, and individual citizens. The final lesson challenges students to apply what they have learned by evaluating the merits and potential problems associated with plastic grocery bags. Students also consider ways of preventing as well as remedying detrimental environmental outcomes.

### California Content Standard Addressed to Mastery

#### California Standard set number

11.5

#### California Standard set statement

Students analyze the major political, social, economic, technological, and cultural developments of the 1920s.

#### Grade, standard set number, and standard number or letter

11.5.7

#### Standard statement

Discuss the rise of mass production techniques, the growth of cities, the impact of new technologies (for example, the automobile, electricity), and the resulting prosperity and effect on the American landscape.

## **Environmental Principle and Concepts**

### **California Environmental Principle IV EP&C Principle Statement**

The exchange of matter between natural systems and human societies affects the long-term functioning of both.

#### **Concept letters and statements**

**Concept A:** Students need to know that the effects of human activities on natural systems are directly related to the quantities of resources consumed and to the quantity and characteristics of the resulting byproducts.

**Concept B:** Students need to know that the byproducts of human activity are not readily prevented from entering natural systems and may be beneficial, neutral, or detrimental in their effect.

## **At a Glance**

### **Lesson 1 Title**

New Inventions Bring New Challenges

### **Lesson 1 Description**

Read about the California Tracy Tire Fire and identify effects of tire production on natural systems.

### **Lesson 2 Title**

The Rise of Mass Production

### **Lesson 2 Description**

Examine the relationships among inventions, natural resources, and mass production.

### **Lesson 3 Title**

A Rise in Mass Consumption

### **Lesson 3 Description**

Explore the mass production and consumption cycle. They analyze ads and complete a product chart.

### **Lesson 4 Title**

Changing the American Landscape

### **Lesson 4 Description**

View American landscapes to discover the effects of production and consumption on natural systems.

### **Lesson 5 Title**

Managing the Consequences

### **Lesson 5 Description**

Investigate how plastic bags illustrate the effects of new technologies on natural systems.



## California Connections

### ***California Connections: California's Tire Problem***

#### **Part 1**

In August 1998, over seven million tires caught fire in an illegal dump outside of Tracy, California. Dense black smoke plumed to heights of 6,500 feet, carrying with it particulate matter, carbon monoxide, nitrogen oxides, toxic substances, and heavy metals. Tire piles had reached as high as 50 feet and spread out over 52 acres among used oil filters, abandoned vehicles, broken trailers, and other refuse. The fire started when the tire dump's owner was mowing nearby grassland. When sparks from his tractor engine ignited the grassland, flames leapt to the piles of tires. Emergency response teams decided not to extinguish the fire. They feared that water used to dampen the flames would create hazardous runoff, which could threaten groundwater. The Tracy Tire Fire burned for more than two years before firefighters finally extinguished it in December 2000. It took over five years to remove partially burned tires, debris, and more than 50,000 cubic yards of contaminated waste. Clean-up costs totaled \$18 million.

The Tracy Tire Fire was an environmental disaster resulting from the millions of used tires accumulating in California since the 1920s. Tires themselves are not classified as hazardous waste. However, once ignited, they create dense clouds of hazardous pollutants that can linger in the air for months, even years, because tire fires are so difficult to extinguish. Because of their hollow shape, about 75% of a tire is empty space. This space is not only impermeable to water, but also holds a large oxygen supply and even funnels air drafts throughout tire piles to “fan” a fire. Tire fires burn at excessively high temperatures, which forces pyrolytic oil—a kind of tar—out of the tire rubber. Each tire contains approximately two gallons of oil, which, if released, can contaminate fresh water much like an oil spill. Hazardous waste resulting from a tire fire can also contaminate surrounding areas with arsenic, lead, and thousands of other toxic compounds. This toxic waste must be contained so that it does not leach into groundwater or other nearby water sources. In many cases, the contaminated soil must be removed and transported to a hazardous waste landfill.

California has more registered vehicles than any other state. A byproduct of this “car culture” is the consumption of a staggering number of tires. Californians generate 40.8 million waste tires annually, some of which are in good enough condition for reuse. Another 1.5 million old tires remain in unpermitted stockpiles. Tires are inappropriate for municipal landfills, where their light weight and large size allow them to rise to the top of the waste pile. Here, they accumulate in a layer of tires on top of the trash heap, creating a fire hazard. They also collect rainwater, providing habitat for mosquito larvae.

People often travel to impoverished areas such as inner-city alleyways, rural communities, and the U.S.-Mexico border region to dump used tires. Some people dump their old tires because they simply don't know any better. Others dump their old tires because they don't care; if the tires are not in their own backyard, they don't think about them anymore. It takes a major environmental disaster such as the Tracy Tire Fire to remind us of just how dangerous it is to stockpile tires anywhere.

Californians will consume approximately 200 million tires over the next five years. This means we will have 200 million additional waste tires to manage. As our population grows and more cars drive our highways every year, an important question remains, what should we do with all of these tires?

#### **Part 2**

The California Integrated Waste Management Board (CIWMB) is one of six agencies under the umbrella of the California Environmental Protection Agency (Cal/EPA). The CIWMB is responsible for the collection, transportation, processing, recycling, or disposal of waste materials in California. Its job includes managing waste tires. It takes an active role in reducing landfill waste and stockpiling, in recycling material from used tires, and in protecting public health and the environment.

Each year, CIWMB successfully diverts over 30 million used tires from stockpiles or landfills. CIWMB provides money to local governments to recover waste tires from the public. It also pays for the development of public education materials to raise public awareness about the problem of waste tires in California.

Once waste tires are collected, they can be reused, retreaded, or recycled in many ways. If tires still have a legal tread depth, they can be reused. In 2006, 2.1 million used tires were sold and reused. If tire tread is too worn down for reuse, the casing can be retreaded. California has over 50 retread plants, which sold 4.4 million retreaded tires in 2006.

One of the main ways CIWMB keeps tire waste out of landfills is by developing markets for recycled tire materials. It funds research projects to find new uses for tire products, as well as provides economic incentives to local governments and businesses to use and manufacture recycled tire products. One such product is crumb rubber, which can be used for playground turf, speed bumps, carpet tiles, mats, sound barriers, and molded rubber products. Rubberized asphalt can be used to repave roads. It is more durable and smoother than conventional asphalt and helps reduce traffic noise. Tire shreds have been used to build highway retaining walls, as well as dampen the sound in light-rail systems. Tires are also burned for fuel, most of which is used in the cement manufacturing industry. The public can support such new uses of old tires by buying tire-derived products such as playground equipment, roof shingles, and new tires made from recycled rubber.

CIWMB also plays a major role in the cleanup and remediation of tire dumps, as well as the tracking and law enforcement needed to prevent such dumps. It began remediating old tire piles in 1994, and has since removed over 771,128 tons of illegal waste tires and contaminated trash from 60 sites. Cleanup involves stabilizing tire piles, removing and transporting tires to a facility where they can be recycled, and removing any leftover toxic wastes. The total cost of site remediation has been \$40 million, with most of this money spent on the state's major tire fires such as the one in Tracy.

CIWMB works with local law enforcement and highway patrol agencies to stop illegal tire dumping, which is concentrated in U.S. border regions. Some of the tools they use to monitor illegal tire dumping include satellite technology and motion-activated surveillance. The Waste and Used Tire Hauler and Manifest Program requires waste haulers to register and record each tire transaction. This tracking system helps to monitor the flow of waste in the state.

When Cal/EPA, local governments, law enforcement agencies, private businesses, and an educated public work together, tires can be reused, retreaded, or recycled to make many useful products. Used tires are not just a waste product to be discarded. Instead, when handled properly, they can become a resource.

## Background For Teachers

### Background Text

Economic developments and associated political, social, and environmental changes frequently follow particular patterns. New technology provides a basis for the development of new consumer goods, the production of which draws on natural resources and **ecosystem goods** extracted from nature. Marketing and other practices stimulate increased consumer demand for those products, which in turn pushes investment to fuel further production. That increased production creates a “pull” for further technological development and expanded **extraction** of natural resources. During production and subsequent consumption, manufactured products produce waste **byproducts**, many of which can have detrimental effects on natural systems. The ensuing changes in lifestyle, as well as the environmental and political consequences, may further advance this process or, at times, slow its pace.

The 1920s represent a remarkably vivid expression of these dynamics. Both the speed and the scale of these processes were markedly greater during that period than had ever occurred previously in U.S. history. The terms “**mass production**” and “**mass consumption**” clearly describe the patterns that accelerated during the Roaring Twenties. A confluence of circumstances helps explain why these changes happened during that particular decade.

During World War I, new scientific ideas led to new technologies as part of the military effort, particularly in support of U.S. allies. Techniques of mass industrial production had been in use since the Civil War, but the scale of this global war created tremendous pressures to replace outmoded technologies with new ones that could sustain large-scale fighting on the battlefield. Some new mass-produced items, such as poison gases, submarines, tanks, small arms, and flamethrowers, were designed exclusively to wage war, but others, such as airplanes, radios, and canned foods, could be used directly by civilians or adapted for civilian purposes. By the end of World War I, the United States was producing items like automobiles and trucks at a rate far higher than before. It also had a new infrastructure built on innovative modifications to older systems, like the assembly line, to support mass production of other items that would revolutionize U.S. society.

The list of goods produced and consumed in mass quantities for the first time during the 1920s is extensive. From the automobile to processed foods to appliances powered by electricity—which itself spread to areas of use previously unimagined—Americans began to change the ways they conducted their daily activities. First in the cities and eventually in the farthest reaches of the countryside, people came to own and use these new products. Radios, refrigerators, gas and electric ranges, and vacuum cleaners either replaced existing tools or took their place in the pantheon of common household appliances.

What generated the demand for these new products? Certainly, much of it derived from the usefulness of the products themselves. Automobiles provided mobility; radios expanded communication; appliances assisted workloads. At the same time, both industries and individual entrepreneurs worked hard to generate increasing demand on the part of consumers. Marketing campaigns sought to convince hardworking Americans that they needed and deserved the many new products being mass-produced. National advertising of branded goods grew with the rise of department stores, expansion of mail-order catalogues, and the increase in mass-circulation magazines. The advertisements promoted goods to engage Americans in leisure-time activities such as movies and sports, and they encouraged the celebration of prosperity through the acquisition of material goods.

New marketing approaches proved extremely successful in inculcating a sense of “need” on the part of potential buyers, using advertising and other means to create a new ethos around the connection between consumption and personal identity. Systems to stimulate investment and to provide consumers with opportunities to use credit to purchase items for which they did

not have actual money on hand also played a huge role in pushing mass consumption of mass-produced goods.

Mass production requires extraction of natural resources for both raw materials and production power. Oil, gas, and water derived from natural systems provided sources of energy to fuel factory production of products as well as the home use of many new appliances. Trees provided lumber, resins, and cellulose needed for products and for building. Waterways supplied production needs and transportation avenues for raw materials and processed goods. Minerals helped to surface roads and to make building and industrial products.

All of these natural resources fueled a system set up to satisfy consumers' "needs" for new products. The effects on the environment were extensive as people increasingly extracted and consumed nonrenewable resources, sought new supplies, paved lands with cement roads, and fostered the growth of cities.

The "positive feedback loop" of demand-production-consumption (consumption of both the products and the natural resources needed to make them) characterized the 1920s. Heightened demand stimulated investment in new technologies and increased production, which in turn led to greater consumption and increasing demand for associated products. With increasing numbers of cars came the need for more and better roads; as people traveled more, they needed motels to sleep in. As people bought more refrigerators and other appliances, additional electrical lines had to be run and more towers built. This required increasing draws on natural resources to provide the steel, paint, textiles, rubber, and electricity needed for production, and the oil for gasoline to keep cars running. Marketing drove the loop faster, as consumers developed a need for bigger cars and more home appliances, and manufacturers extracted the resources to keep up with demand.

The building of Love Canal in the 1890s exemplifies how the exchange between natural systems and human societies can affect the long-term functioning of both. William T. Love intended to build a canal connecting the two levels of the Niagara River separated by Niagara Falls. He believed he could produce hydroelectricity to serve the region's growing industries; however, he never completed this power plan due to complications.

After 1892, Love decided to instead develop a shipping lane to bypass Niagara Falls. He envisioned an ideal urban area called "Model City" and planned to build a community of parks and homes. Soon after he started digging the canal and building streets and homes, he ran out of money and abandoned the project. In the 1920s, the canal became a municipal and industrial dump site. In the 1940s, the Hooker Chemical Company purchased the Love Canal as an ideal dump site for its chemical waste. The company had prospered in the production of plastics to satisfy American consumers' appetites for goods, but the production process generated **toxic waste** byproducts. The company lined the canal with clay, placed metal barrels of waste in the site, and covered them. Several years later, the community that grew up around the Love Canal began to grapple with life-threatening illnesses. The toxic waste, once secured in the barrels, had seeped into the canal and into the region's groundwater. The American landscape had indeed begun to change in the form of environmental degradation because of mass production and mass consumption of goods that sought to enhance the American lifestyle.

By and large, the process of economic expansion and its associated effects went on unabated. The effects on lifestyle were dramatic. Cities grew as industry developed. Los Angeles, for example, more than doubled in size from less than 600,000 to more than 1.2 million people between 1920 and 1930. With the possibility of commuting into cities, people moved to the suburbs, which expanded at more than double the rate of the cities themselves. The nature of work itself, both for assembly-line workers and for those who managed them, also changed. Even people's relationship with food changed; with new technologies to process and package foods, agrarian "zones" developed in which farmers specialized in "commodity" food production, and grocery stores sold food far from where it was grown.

The effects on the environment were equally far-reaching. Besides the consequences of resource extraction, the waste byproducts created by both production and consumption of new products changed the landscape. Municipal **landfills** – the standard system for disposing of the new byproducts – became a controversial new feature of the American landscape in the 1920s. Pollution of soil, air, waterways, and marine environments skyrocketed. Many toxic pollutants, such as the benzene found in gasoline, had negative effects on health.

In a laissez-faire era, the federal government did little to help regulate or mitigate practices that created systemic problems, and the laws that existed were often ignored or circumvented. The effects of pollution and waste continued into the late twentieth century and, in many cases, continue today. Yet government can play a role both in remedying problems created in the past and in preventing those that may lie in the future. Government may choose to regulate certain industries to protect the public interest, create programs to mitigate existing problems, or develop **incentives** for industry to invest in new technologies that do not degrade the environment. Citizens, as individual members of society and in cooperating groups, also have important roles to play. They are important actors in the fight to support responsible environmental policies and practices.

### **Glossary**

**Byproduct:** Incidental products or results of human or natural system processes, such as materials remaining after manufacturing.

**Ecosystem goods:** tangible materials such as timber and food produced by natural systems that are essential to human life, economies, and cultures.

**Extraction:** The removal of a natural resource or the separation of a metal from ore.

**Incentive:** Something that motivates or inspires someone to take a certain action.

**Landfill:** A solid waste disposal site where garbage is buried between layers of dirt.

**Mass consumption:** The act or process of consuming in large, or mass, quantities.

**Mass production:** The production of goods in large, or mass, quantities.

**Natural system:** The interacting and/or interdependent components, processes, cycles, and interactions among organisms and their habitats.

**Toxic waste:** Refuse material that may be poisonous and harmful.

## Unit Planner Spread

### Lesson 1

#### Lesson Title

New Inventions Bring New Challenges

#### Learning Objective

Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).

#### At a Glance

Students read about the Tracy Tire Fire in **California**

**Connections:** **California's Tire Problem** and view photos of the fire. They identify natural resources used to make tires and discuss the direct and indirect effects of tire production on natural systems.

#### Prerequisite Knowledge

**Students should know about:**

- ◆ how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change.
- ◆ the connections among natural resources, entrepreneurship, labor, and capital in an industrial economy.

**Students should be able to:**

- ◆ summarize information in writing.

#### Preparation Time

10 min.

#### Instructional Time

55 min.

### Lesson 2

#### Lesson Title

The Rise of Mass Production

#### Learning Objective

Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems. Students learn about inventions, mass production, and mass consumption, and then summarize basic ideas in a graphic organizer. Using cars as an example, they begin a chart that analyzes the intended and unintended consequences and environmental effects of mass-produced consumer goods.

#### At a Glance

#### Prerequisite Knowledge

**Students should know about:**

- ◆ the transformation of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.

**Students should be able to:**

- ◆ analyze cause and effect.
- ◆ take lecture notes.

#### Preparation Time

15 min.

#### Instructional Time

55 min.

### Lesson 3

#### Lesson Title

A Rise in Mass Consumption

<b>Learning Objectives</b>	<p>Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems.</p> <p>Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).</p>
<b>At a Glance</b>	<p>Students use a chart to explore the rise of mass production and mass consumption. In small groups, they discuss ads from the 1920s and compile information about several products. Students analyze ads for advertising concepts and write about the influence of marketing.</p>
<b>Prerequisite Knowledge</b>	<p><b>Students should know about:</b></p> <ul style="list-style-type: none"> <li>◆ the transformation of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.</li> <li>◆ the significant inventors and their inventions from the late 19th and early 20th centuries, and how they improved the quality of life.</li> </ul> <p><b>Students should be able to:</b></p> <ul style="list-style-type: none"> <li>◆ draw upon prior knowledge and experience to analyze goods for their intended and unintended uses as well as materials used to develop the product.</li> <li>◆ analyze advertisements for information and interpretation.</li> </ul>
<b>Preparation Time</b>	10 min.
<b>Instructional Time</b>	55 min.
<b>Lesson 4</b>	
<b>Lesson Title</b>	Changing the American Landscape
<b>Learning Objective</b>	Describe the direct and indirect influences of growing cities on the American landscape and the associated natural systems.
<b>At a Glance</b>	<p>Students discuss scenes depicting American landscapes in the 1920s, learn about lifestyle changes based on mass production and consumption, and complete a graphic about the relationships between the cycle of production and consumption and natural systems.</p>
<b>Prerequisite Knowledge</b>	<p><b>Students should know about:</b></p> <ul style="list-style-type: none"> <li>◆ patterns of agricultural and industrial development as they relate to climate, use of natural resources, markets, and trade.</li> <li>◆ the location and effects of urbanization, renewed immigration, and industrialization.</li> </ul> <p><b>Students should be able to:</b></p> <ul style="list-style-type: none"> <li>• identify natural systems.</li> <li>• take lecture notes.</li> </ul>

**Preparation Time** 10 min.  
**Instructional Time** 55 min.

## Lesson 5

### Lesson Title

Managing the Consequences

### Learning Objectives

Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems.

Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).

### At a Glance

Students review ***California Connections: California's Tire Problem*** and brainstorm mass-produced goods in use today. After completing a chart applying the cycle of mass production and consumption to plastic bags, they discuss and write about the effects of plastic bags on natural systems.

### Prerequisite Knowledge

**Students should know about:**

- ◆ transformations of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.
- ◆ the connections among natural resources, entrepreneurship, labor, and capital in an industrial economy.

**Students should be able to:**

- ◆ interpret charts and graphic organizers.
- ◆ take lecture notes.
- ◆ summarize ideas in a written response.

**Preparation Time** 10 min.  
**Instructional Time** 55 min.

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ binder paper
- ◆ chalk or dry-erase markers
- ◆ chart paper
- ◆ pencils or pens
- ◆ scratch paper

### Textbook Alignment

**AMSCO:** United States History Pages 473-479



**Glencoe:** American Odyssey, the United States in the 20<sup>th</sup> Century (2004) Pages 359, 361, 368, 372-373, 380, 385

The American Republic Since 1877 (2005) SE Pages 516, 518-520, 524

The American Vision (2005) SE Pages 625, 641-642, TE Pages 641, 644

The American Vision Modern Times (2006) SE Pages 450-455, 460-461, 463

**Holt:** American Nation in the Modern Era (2005) Pages 414-421, 438-439

**McDougal Littell:** The American Pageant, Twelfth Edition PE Pages 739-748, 751-752, GGB Pages 315-323

The Enduring Vision, Fourth Edition PE Pages 680-683, 688-690, SG Pages v2 90-92

The Americans: Reconstruction to the 21<sup>st</sup> Century (2003) Pages 421-427, 430-431

**Prentice Hall:** America Past and Present (2002) Pages 735-740

America Pathways to the Present, Modern American History (2005) Pages 496-499, 501-506

America Pathways to the Present, Modern American History (2007) Pages 491-499, 501-502, 504-505

Based on sample textbooks available at the time of production.

## Unit Assessment Spread

### Traditional Unit Assessment

#### Description

This traditional unit assessment is designed to parallel the structure and format of tests used in California's adopted instructional materials and statewide assessments.

**Mass Production, Marketing, and Consumption** (Traditional Unit Assessment Master) is comprised of multiple choice and short answer questions that assess students' achievement of the unit's learning objectives. Successful completion of this test demonstrates their proficiency with History-Social Science standard 11.5.7.: "Discuss the rise of mass production techniques, the growth of cities, the impact of new technologies (for example, the automobile, electricity), and the resulting prosperity and effect on the American landscape."

Distribute a copy of **Mass Production, Marketing, and Consumption** to each student. Collect completed tests.

#### Suggested Scoring

An Answer Key and Sample Answers for **Mass Production, Marketing, and Consumption** are provided on pages xx-xx. There are 50 total points possible.

#### Advanced Preparation

**Gather and prepare Assessment Masters:**

**Mass Production, Marketing, and Consumption**

SM, Pages xx-xx

One per student

#### Preparation Time

10 min.

#### Assessment Time

50 min.

## Answer Key and Sample Answers

### Mass Production, Marketing, and Consumption (Traditional Unit Assessment Master)

Name: \_\_\_\_\_

#### Part 1:

**Multiple Choice:** Select the best answer and circle the correct letter. (2 points each)

1. Which of the following was not a result of mass production techniques in the 1920s?
  - a. extraction of natural resources
  - b. development of the assembly line
  - c. consumption of manufactured goods
  - d. increased costs of automobiles
2. Which of the following was a pattern that repeated during the 1920s?
  - a. products consumed; products produced; demand for more products
  - b. products produced; products consumed; demand for more products
  - c. byproducts and waste; demand for more products; products consumed
  - d. demand for more products; products consumed; investments made
3. A beneficial byproduct made from coal tar is
  - a. automobiles
  - b. gasoline
  - c. plastics
  - d. telephones
4. In the 1920s, the rate of consumption decreased for which of the following manufactured goods?
  - a. cameras
  - b. lightbulbs
  - c. vacuum cleaners
  - d. weapons
5. The development of plastic shopping bags is an example of
  - a. mass consumption
  - b. mass production
  - c. new technology
  - d. marketing
6. Which of the following is a negative effect of mass production and consumption on natural systems?
  - a. bioplastic bags
  - b. Pacific Garbage Patch
  - c. polyethylene
  - d. recycling
7. Which of the following is remediation due to the detrimental effect of mass production and consumption on natural systems?
  - a. white pollution
  - b. north Pacific currents
  - c. plastic bag bans
  - d. sanitary landfills

8. In the 1920s, affordable cars and new roads had a direct influence on the American landscape through
- 40-hour workweeks
  - the expansion of suburbs
  - the purchase of home appliances
  - the use of assembly lines
9. Which of the following statements best describes an indirect influence of growing cities on the American landscape and its natural systems?
- Landfills were made to dispose of the increased waste from consumption.
  - A prosperous decade provided stable jobs, letting many people increase their leisure time.
  - Mass production led to increased uses of natural resources such as oil and steel.
  - Electricity replaced coal and water as fuel for manufacturing.
10. Building roads, restaurants, and filling stations were a result of which innovation used in the 1920s?
- assembly line
  - marketing
  - landfills
  - steam engines
11. Which of the following is an example of direct effects of new technologies on natural systems?
- building highways for cars
  - animals ingesting plastics
  - pumping oil for fuel for cars
  - sanitary landfills for plastic bags
12. Which of the following is an example of indirect effects of new technologies on natural systems?
- conversion of steam to electricity
  - electrical lighting in homes
  - mining iron ore to make cars
  - roadside filling stations
13. Which of the following statements best describes the effects of many new home appliances introduced in the 1920s on natural systems?
- Women found more leisure time due to modern conveniences.
  - Time-saving appliances such as the washer decreased water pollution.
  - More homes needed energy and were wired for electricity.
  - Renewable natural resources provided raw materials for production.
14. What stimulated the demand for more mass-produced goods?
- byproducts
  - investments
  - marketing
  - waste

15. Which invention led to unintended consequences in dump sites like the one in Tracy, California?

- a. automobile
- b. hair dryers
- c. plastics
- d. telephones

## Part 2: Short Answer

**Directions:** Answer the following questions. (4 points each)

16. What caused the rise of mass production and mass consumption in the 1920s?

In the 1920s, after WWI, factories that had mass-produced weapons and military goods began making consumer products. Technologies for mass production improved. For example, Henry Ford improved the assembly line to make cars more quickly and less expensively. Transportation systems also improved. This made natural resources more available to factories and allowed mass-produced goods to be transported to markets around the world. More consumer products available at lower costs and good marketing of these products led to mass consumption.

17. What was the relationship between mass production, natural resources, consumption, and byproducts in the 1920s?

In the 1920s, more and more consumer items were mass-produced to meet the mass consumption needs of the American public. Producing these items required natural resources, such as coal, oil, water, rubber, gas, etc. Manufacturing more consumer goods meant that more natural resources were needed. The manufacturing process also produced byproducts, or excess materials. In addition, byproducts were generated when some products, such as lightbulbs, were discarded after use. The disposal of byproducts from mass production and mass consumption affected the natural systems that provided natural resources.

18. What is an example of a direct effect of new technologies on natural systems?

Pumping oil from the ground to make new products, such as cars, jet engines, and electric shavers, is an example of a direct effect of new technologies on natural systems.

19. What is an example of an indirect effect of new technologies on natural systems?

Paving roads, building gas stations, and opening roadside restaurants between cities are examples of indirect effects of a new technology—the automobile—on natural systems. Roads and buildings consumed land and altered natural systems on the plains and in the forests. Gas stations and restaurants added waste and pollution to their environments.

20. How did growing cities in the 1920s influence the American landscape and the associated natural systems?

As cities grew in the 1920s, larger transportation systems were created within and between cities. This led to more paved roads, more gas stations, and the building of motels and restaurants between cities, and more effects on natural systems. In the cities, more jobs were available and people had more spending money to use for leisure activities and goods. The byproducts of these activities and goods led to the development of landfills, which had a large effect on natural systems.

## **Alternative Unit Assessment**

### **Description**

The assessment strategy described below offers students an alternative way to demonstrate their achievement of the unit's learning objectives and mastery of the standard. There are many other alternative assessment strategies that teachers may choose to develop for use with this unit. Additionally, some students may require assessment strategies that are adapted to their individual needs.

**Public Service Announcement** (Alternative Unit Assessment Master) has students select a technology or product from this unit or from the present and create a public service announcement (PSA) set in the corresponding period (either the 1920s or today). This PSA demonstrates their proficiency with History-Social Science standard 11.5.7.: "Discuss the rise of mass production techniques, the growth of cities, the impact of new technologies (for example, the automobile, electricity), and the resulting prosperity and effect on the American landscape."

### **Suggested Scoring**

Use the **Public Service Announcement Scoring Tool** provided on page xx and the sample provided on page xx to assess students' work. There are 20 total points possible.

### **Advanced Preparation**

**Gather and prepare Assessment Masters.**

**Public Service Announcement**

SM, Pages xx-xx

One per student

**Gather and prepare Materials Needed.**

**Materials Needed for Alternative Assessment:**

**Class Supplies:**

- ◆ chalk or dry-erase markers, chart paper, markers, scratch paper

**Preparation Time**

5 min.

**Assessment Time**

55 min.

**Safety Notes**

None

## Procedures

### Step 1

Ask students to describe a public service announcement, a “PSA.” Write their responses on the board. (*Noncommercial advertisement found on radio, television, or Internet; related to public good; intended to inform or influence public attitudes about specific issues; intended to raise awareness about issues.*)

Ask students to share examples of public service announcements they have seen. (*Increase literacy; mentor children; eat right and exercise to avoid heart disease; smoking is harmful to people’s health; clean up the beach; carpool.*)

### Step 2

Brainstorm with students issues raised during this instructional unit. List these issues on the board. (*Post-war economy shifted from mass production of military goods to mass production of commercial or household goods; available natural resources made mass production possible; inventions and innovations inspired mass production; marketing and credit promoted mass consumption; mass consumption encouraged investors to support more mass production; mass production creates byproducts; mass production utilizes natural resources; direct consequences of mass production and consumption includes extraction of natural resources; indirect consequences of mass production and consumption includes buildings, roads, dumps/ landfills, pollution*)

Brainstorm with students some technologies and products from the 1920s or today that caused or cause effects that a PSA might address. Write students’ ideas on the board. (*Canned food; hair dryers; plastic telephones; nonrechargeable batteries; plastic water bottles; Styrofoam containers; fast food; direct mail catalogues; incandescent lightbulbs*)

### Step 3

Distribute copies of **Public Service Announcement** (Alternative Unit Assessment Master) and review the directions with students.

Explain that students may work independently or in pairs during the 20-minute preparation period, but they must write their own PSAs. Remind students to refer to the board for descriptions of a PSA to ensure that they are planning, practicing, and presenting issue-related advertisements intended to inform and influence public attitudes.

### Step 4

At the end of the 20 minutes, have students return to their seats to write their PSAs. Make materials available if students wish to make visuals to accompany their PSAs. Tell students to write a script on scratch paper, practice giving the announcement, and then copy the announcement onto the **Public Service Announcement** form. Give students 20 minutes to complete their PSAs.

### Step 5 (Optional)

If time allows, invite some students to present their PSAs to the class.

## Scoring Tool

### Public Service Announcement Scoring Tool

5	<ul style="list-style-type: none"> <li>• Provides accurate background information about the technology/product.</li> <li>• Accurately describes how this technology/product relates to natural resources or natural systems.</li> <li>• Accurately explains the direct and/or indirect effects of this technology/product on natural systems.</li> <li>• Provides accurate information about how production and consumption of this technology/product generates byproducts and changes to the American landscape.</li> <li>• Provides reasonable suggestions for the public about use/consumption of this technology/product.</li> </ul>
4	<ul style="list-style-type: none"> <li>• Provides some background information about the technology/product.</li> <li>• Describes, in general, how this technology/product relates to natural resources or natural systems.</li> <li>• Explains, in general, the direct and/or indirect effects of this technology/product on natural systems.</li> <li>• Provides some information about how production and consumption of this technology/product generates byproducts and changes to the American landscape.</li> <li>• Provides a reasonable suggestion for the public about use/consumption of this technology/product.</li> </ul>
3	<p>Includes three of the following:</p> <ul style="list-style-type: none"> <li>• Provides some background information about the technology/product.</li> <li>• Describes, in general, how this technology/product relates to natural resources or natural systems.</li> <li>• Explains, in general, the direct and/or indirect effects of this technology/product on natural systems.</li> <li>• Provides some information about how production and consumption of this technology/product generates byproducts and changes to the American landscape.</li> <li>• Provides a reasonable suggestion for the public about use/consumption of this technology/product.</li> </ul>
2	<p>Includes two of the following:</p> <ul style="list-style-type: none"> <li>• Provides some background information about the technology/product.</li> <li>• Describes, in general, how this technology/product relates to natural resources or natural systems.</li> <li>• Explains, in general, the direct and/or indirect effects of this technology/product on natural systems.</li> <li>• Provides some information about how production and consumption of this technology/product generates byproducts and changes to the American landscape.</li> <li>• Provides a reasonable suggestion for the public about use/consumption of this technology/product.</li> </ul>
1	<p>Includes one of the following:</p> <ul style="list-style-type: none"> <li>• Provides some background information about the technology/product.</li> <li>• Describes, in general, how this technology/product relates to natural resources or natural systems.</li> <li>• Explains, in general, the direct and/or indirect effects of this</li> </ul>



	<p>technology/product on natural systems.</p> <ul style="list-style-type: none"> <li>• Provides some information about how production and consumption of this technology/product generates byproducts and changes to the American landscape.</li> <li>• Provides a reasonable suggestion for the public about use/consumption of this technology/product.</li> </ul>
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## Answer Key and Sample Answers

### Public Service Announcement (Alternative Unit Assessment Master)

**Design:** Create as an activity master; provide space below for students to write the Public Service Announcement.

Name: \_\_\_\_\_

#### Directions:

1. Select a technology or product from this unit or from the present and create a public service announcement set in the corresponding period (either the 1920s or today).
2. Work independently or in pairs during the 20-minute preparation period, but write your own PSA on scratch paper and then copy into the space below.
3. Refer to the board for descriptions of a PSA to ensure that you are planning, practicing, and presenting issue-related advertisements intended to inform and influence public attitudes.
4. Determine the appropriate year for the delivery of the PSA.
5. Write a PSA that could be delivered via radio (1920s) or television (today). Introduce the PSA by stating the year and the product selected. The PSA should not last more than 60 seconds and must include:
  - ◆ background information about the technology or product.
  - ◆ a description of how this technology or product relates to natural resources or natural systems.
  - ◆ an explanation of the direct and/or indirect effects of this technology/product on natural systems.
  - ◆ information about how production and consumption of this technology/product generates byproducts and changes the American landscape.
  - ◆ suggestions for the public about use/consumption of this technology/product.

### Public Service Announcement

Year: 1925

Product: Automobile

A brand new, shiny, black Model T purrs down the street. Each pattering sound reminds you of the ads that claim that every American deserves one of these cars. You wonder, "Will life really be better, easier, and more glamorous with one of these vehicles in front of my home?"

Don't buy into the excitement about cars. Cars consume our natural resources and threaten our environment. Producing a car requires metals for the car frame, rubber for the tires, cotton for seat covers, oil and natural gas to power the car factories, and oil to run the car itself. Obtaining these resources directly changes our natural systems. Byproducts indirectly affect our environment through pollution. Soon we will have tar roads suffocating the land from New York to California! What will become of our beautiful fields, plains, prairies, and canyons? How will we dispose of old cars?

Ads may tell you that every American deserves a car, but how will that affect our country? Get together with your neighbors and purchase a community car. Share the driving. Use your car to get to important places at important times. Otherwise, keep walking. Protect our beautiful America.

**Alternative Unit Assessment Master**

**Public Service Announcement** (Alternative Unit Assessment Master)

**See Answer Key**

## Extensions & Unit Resources Spread

### Extension Ideas

Have students develop a multimedia presentation (PowerPoint, short film, Web site) in which they take a current consumer item, identify the costs and benefits of producing and consuming this item (immediate, short- and long-term effects), and suggest approaches to be taken by individuals, groups, and governments to remedy problems and prevent foreseeable future environmental costs. Students must incorporate historical perspectives by referencing at least one example from the 1920s of economic or technological costs and benefits or environmental effects.

Have students research additional consumer goods introduced in the 1920s and create parallel timelines identifying goods that were beneficial to the environment and goods that were detrimental to the environment. Have students present these timelines, and then post them to compare and contrast through viewing and discussion.

Have students select one appliance or consumer good introduced in the 1920s and research the natural resources required for this product. Then, have students map the possible sources of these materials on a world map and present the information to the class. Lead a class discussion about the locations of the natural resources used to mass-produce the chosen product in the United States.

### Resources for Students

California Environmental Protection Agency. <http://www.calepa.ca.gov/>

California Integrated Waste Management Board. 2007. Tire Fires.  
<http://www.ciwmb.ca.gov/Tires/Fires/>

Greenfeet Newsletter about Plastics and Water Pollution  
<http://www.greenfeet.net/newsletter/nl200407.shtml>

National Geographic Society. Wild Chronicles DVD Set. Segment: 234c Chad Pregracke, Potomac Clean-Up

PBS Online News Hour: Plastic Pollution in the Ocean  
[http://www.pbs.org/newshour/forum/science/july-dec08/plastic\\_11-13.html](http://www.pbs.org/newshour/forum/science/july-dec08/plastic_11-13.html)

The People History. 1920s History.  
<http://www.thepeoplehistory.com/1920s.html>

Stanley, Mark, and Jessie Corson. American Inventions of the 1920s.  
<http://www.msad54.org/sahs/socialstudies/finely/1920s/1920gr3/Inventions.html>

The Surfrider Foundation  
<http://www.surfrider.org/>

### References for Teachers

Beck, E. 2007. The Love Canal Tragedy. Environmental Protection Agency.  
<http://www.epa.gov/history/topics/lovecanal/01.htm>

California Integrated Waste Management Board. 2007. Tire Fires.  
<http://www.ciwmb.ca.gov/Tires/Fires/>

Goodyear Tires. Radial Tire Production.  
<http://www.goodyear tires.com/about/testing/radial.html>

McCarthy, T. 2007. Auto Mania: Cars, Consumer, and the Environment. New Have: Yale University Press.

Swicofil AG Textile Services. Tire Production Info. <http://www.swicofil.com/tire.html>

### **Instructional Support**

Agencies, institutions, and organizations throughout California have identified themselves as providing programs and materials that support this unit. Links to these resources are available at <http://www.calepa.ca.gov/Education/EEI/Curriculum/Support.htm>

## Lesson 1

### Lesson Title

New Inventions Bring New Challenges

### Introduction

The Roaring Twenties was a time when new inventions and consumer goods began to change the lifestyles of Americans. In this lesson, students learn about some of the long-term, indirect effects on natural systems of one of these inventions—the automobile. Once large-scale manufacturing of cars began in the early 1900s, the demand for cars, and for tires, increased dramatically.

In this lesson, students first consider the intended consequences of cars and tires. Students then learn about the direct effects to natural systems from tire manufacturing. They next consider some indirect effects of tire disposal as they read Part 1 of ***California Connections: California's Tire Problem***, which focuses on tire dump sites and the Tracy Tire Fire. Students discuss ways that tires and their disposal have affected natural systems indirectly, and they share their ideas for dealing with the disposal of car tires. Students then read Part 2 of ***California Connections: California's Tire Problem*** and write about the direct and indirect effects of manufacturing tires on natural systems.

### Background

California generates approximately 30 million tires annually, and about 1.5 million are stockpiled (legally and illegally) around the state. The quantity of tires dumped throughout the state threatens the environment because of the potential for a major tire fire, like the one that occurred in Tracy in 1998-2000.

Tires are strong, flexible rubber casings that attach to the rim of a wheel for use on automobiles, trucks, buses, motorcycles, aircraft landing gear, tractors, forklifts, baby carriages, shopping carts, wheelchairs, and bicycles. Natural rubber is the main raw material used in manufacturing tires, although tires also contain synthetic rubber. Natural rubber is the milky liquid in the bark of the rubber tree. Synthetic rubber is made from polymers found in crude oil. American inventor Charles Goodyear accidentally discovered a process for strengthening natural rubber, known as vulcanization, or curing, in 1839. Treatment with heat and a variety of chemicals produces sheets of rubber that are strong, resilient, and wear-resistant enough to use on products such as cars.

In addition to rubber, tires contain carbon black, a fine, soft powder created by burning crude oil or natural gas with a limited amount of oxygen. Tire manufacturing also uses sulfur and other chemicals.

Today, a large tire factory produces more than 250 million new tires each year. A typical all-season passenger tire weighs about 22 pounds. It contains approximately six pounds of five different types of synthetic rubber, four-and-a-half pounds of eight types of natural rubber, five pounds of eight types of carbon black, one-and-a-half pounds of steel cord for belts, one pound of polyester and nylon, one pound of steel beadwire, and three pounds of different kinds of chemicals, waxes, oils, and pigments. When no longer useable, these tires and all of the materials and chemicals that they contain must be managed to avoid environmental contamination. What threats do they pose, and what resources can we gather from them?

### EEI Learning Objective

Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).

**Key Vocabulary**

**Byproduct:** An incidental product or the result of human or natural system processes (for example, materials remaining after manufacturing).

**Consume:** To purchase economic goods or services.

**Consumption:** 1. The process of obtaining energy and matter from a natural system such as by eating other organisms 2. The process of using goods produced by natural or human social systems.

**Incentive:** A policy, action, or reward that motivates or inspires someone or some organization to take a certain action.

**Innovation:** The introduction of something new.

**Landfill:** A solid waste disposal site where garbage is buried between layers of dirt.

**Natural system:** The interacting and/or interdependent components, processes, cycles, and interactions among organisms and their habitats.

**Remediation:** Action to reduce, isolate, or remove contamination from an environment.

**Toxin:** A poisonous substance, especially a protein, which is produced by living cells or organisms. A toxin is capable of causing disease when introduced into the body tissues, but is often also capable of inducing neutralizing antibodies or antitoxins.

**Waste:** 1. Garbage or trash 2. Regarded or discarded as worthless or useless.

## Lesson 1—Toolbox

### Summary of Activities

Students read about the Tracy Tire Fire in ***California Connections: California's Tire Problem*** and view photos of the fire. They identify natural resources used to make tires and discuss the direct and indirect effects of tire production on natural systems.

### Instructional Support

See Extensions & Unit Resources, pages xx-xx.

### Prerequisite Knowledge

#### Students should know about:

- ◆ how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change.
- ◆ the connections among natural resources, entrepreneurship, labor, and capital in an industrial economy.

#### Students should be able to:

- ◆ summarize information in writing.

### Advanced Preparation

**Gather and prepare Activity Masters.**

**Gather and prepare Materials Needed.**

**Gather and prepare Visual Aids:**

- ◆ prepare transparencies.

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ binder paper, chalk or dry-erase markers, pencils or pens

### Visual Aids

#### Transparencies:

- ◆ **Moving Californians**, Visual Aid #X
- ◆ **Car Tire Dump**, Visual Aid #X
- ◆ **Tracy Tire Fire**, Visual Aid #X
- ◆ **Virginia Tire Fire**, Visual Aid #X
- ◆ **After the Tracy Tire Fire**, Visual Aid #X

### Activity Masters



**Key Unit Vocabulary**

SM, Pages xx-xx

One per student

***California Connections: California's Tire Problem***

SM, Pages xx-xx

One per student

**Direct and Indirect Effects of New Technologies**

SM, Pages xx-xx

One per student

**Preparation Time**

10 min.

**Instructional Time**

55 min.

**Safety Notes**

None

## Lesson 1—Procedures

### Vocabulary Development

Use the **Key Unit Vocabulary** (Lesson 1 Activity Master) to introduce new words to students as appropriate. This vocabulary sheet is used throughout the unit.

#### Step 1

Ask students, “In the 1920s, what was the intended purpose of tire manufacturing?” (*Tires for use on cars, trucks, and other vehicles made work and personal travel easier.*) Project the transparency **Moving Californians** (Visual Aid #X). Ask students to imagine all the cars that pass through this interchange every day, and all the tires on those cars.

Introduce students to the term “consume” using the **Key Unit Vocabulary**. Explain to students that California consumes millions of tires every year. Manufacturing tires requires several resources. Initially, natural rubber, steel, chemicals such as sulfur, and energy to heat the rubber were used in the manufacturing process. Today’s tires use synthetic rubber made from oil and petroleum products along with natural rubber. Steel, fiberglass, nylon, and polyester strengthen the tires. Additives such as wax and resins help preserve the tires for longer use.

#### Step 2

Ask students, “Where do the resources needed to manufacture tires come from?” (*Earth, the environment*) Tell them that the term “natural systems” encompasses both of these terms. Use the **Key Unit Vocabulary** to familiarize students with the term “natural systems.” Explain that deserts, forests, and oceans are all natural systems. In order to understand the consequences of tire manufacturing, we need to examine the interactions among the components and processes that make up natural systems. The components are the land, air, water, soil, minerals, plants, and animals. The processes include, for example, the creation of fossil fuels. Further, we need to examine how human practices such as extracting, processing, and manufacturing affect natural systems.

#### Step 3

Using the **Key Unit Vocabulary**, familiarize students with the terms “byproduct,” “consumption,” “landfill,” “remediation,” “toxin,” and “waste.”

Tell students that tire manufacturing affects natural systems directly through the extraction of resources. In addition, it also has many indirect consequences for natural systems, which they will read about in **California Connections: California’s Tire Problem** (Lesson 1 Activity Master).

Distribute copies of **California Connections: California’s Tire Problem**. Instruct students to read Part 1 while keeping in mind the question, “What indirect effects of manufacturing and using tires are presented in the article?”

#### Step 4

When students have finished reading Part 1, project the transparencies **Car Tire Dump** (Visual Aid #X), **Tracy Tire Fire** (Visual Aid #X), and **Virginia Tire Fire** (Visual Aid #X), one at a time. For each transparency, ask the following question and record students’ answers on the board.

- ◆ What are some indirect effects of tire manufacturing presented in the article? (*No safe disposal places/methods; dump sites created for used tires; people do not care where tires are dumped; mosquitoes attracted to standing water in dumped tires; pile of tires caught on fire.*)

Explain to students that even though some of the materials used to make tires come from natural systems, the tire-making process creates products (tires) that cannot naturally be broken down by the environment into their original parts. This makes tires hard to dispose of.

### Step 5

Project the transparency **After the Tracy Tire Fire** (Visual Aid #X). Ask students the following questions.

- ◆ What are some of the concerns about tire disposal and burning raised in the article? (*Tires rise to top of waste piles because of their light weight and size; not appropriate for landfills; space in tires collects water and mosquitoes; burning causes toxic air pollutants; toxins can leach into groundwater; toxins contaminate soil; burning hard to control.*)
- ◆ Why are these concerns? (*People have tires dumped near homes—in alleys, at the border—where fires can start; we need places to dispose of worn tires; mosquitoes carry diseases; people can be harmed by breathing or drinking toxins in air and water; toxins in soil can harm animals and damage plants, including crops we consume.*)

Ask students to discuss with a partner the question at the end of Part 1 (What should we do with all of these tires?). Have volunteers share their ideas with the class.

### Step 6

Explain to students that the California Environmental Protection Agency (Cal/EPA) is the state agency that develops, implements, and enforces the laws that protect our state's environment. The laws help to ensure clean air, clean water, clean soil, safe pesticides, and proper waste recycling and reduction. Explain that the California Integrated Waste Management Board is one part of Cal/EPA. Its job is to manage the estimated 92 million tons of waste generated each year in California. This board works with local governments, industry, and the public to find ways to reduce waste and dispose of it while protecting public health and the environment.

### Step 7

Using **Key Unit Vocabulary**, familiarize students with the terms “incentive” and “innovation.” Draw students’ attention to the two questions written on the board and read the questions aloud to the class. (What are the direct and indirect effects on natural systems of the manufacture and use of automobile tires? How can people minimize the effects of tires on the environment?) Instruct students to read Part 2 of **California Connections: California’s Tire Problem**, keeping in mind the two questions as they read.

### Step 8

After they complete the reading, distribute copies of **Direct and Indirect Effects of New Technologies** (Lesson 1 Activity Master) to each student. Tell the to read the instructions and respond to the questions.

Collect **California Connections: California’s Tire Problem** for future use.

Collect **Direct and Indirect Effects of New Technologies** for use in assessment.

## Lesson 1—Assessment

### Description

**Direct and Indirect Effects of New Technologies** (Lesson 1 Activity Master) assesses students' achievement of the learning objective: "Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials)." On this activity master, students write a one-page response to two questions about the effects of new technologies on natural systems.

### Suggested Scoring

Use the **Direct and Indirect Effects of New Technologies Scoring Tool** provided on page xx and the sample provided on page xx to assess students' work. There are 20 total points possible.

### Answer Keys and Sample Answers

**Direct and Indirect Effects of New Technologies** (Lesson 1 Activity Master)

Write a one-page (200-250 word) response to the questions below. Use information from **California Connections: California's Tire Problem** and class discussions, as well as your own ideas, to answer the questions. Use the **Direct and Indirect Effects of New Technologies Scoring Tool** to guide your writing.

#### Direct and Indirect Effects of New Technologies Scoring Tool

20	Student explains some effects of car tires on natural systems. Student provides several examples of minimizing the effects of car tires on the environment presented in the article.
15	Student identifies some effects of car tires on natural systems. Student provides several examples of minimizing the effects of car tires on the environment presented in the article.
10	Student identifies some effects of car tires on natural systems.
5	Student identifies an effect of car tires on natural systems. or Student provides an example of minimizing the effects of car tires on the environment presented in the article.

What are the direct and indirect effects on natural systems of the manufacture and use of automobile tires? How can people minimize the effects of tires on the environment?

*In today's society, people need cars for transportation. Cars need tires for people to drive safely on roads and to prevent damage to the car. We have not yet invented ways for cars to move around without tires. To make tires, manufacturers need to extract natural resources from the environment, such as rubber, petroleum, sulfur, and metal. They also have to use energy to manufacture the tires. After the tires have been used and disposed of, they can become dangerous to natural systems by releasing toxic byproducts into the soil, groundwater, and air (if burned). Even if they are not burned, they interfere with natural systems because they cannot be buried in landfills, and they sit in dump sites where they often collect rainwater and attract mosquitoes.*

*Today, some tires are being retreaded and made into new tires, or they are being recycled into new products such as roof shingles, playground materials, and speed bumps. Some tires*

are made into fuel, and the process also removes the toxins. Development of new ideas and uses for recycling old tires are encouraged and rewarded by the California state agency called the California Integrated Waste Management Board (CIWMB) through grants. Many more ideas for limiting the harmful effects of car tires on the environment are yet to come. For example, some shoes are now made from old tires, and people are building homes with tires packed with earth and covered in cement.

## **Lesson 1—Activity Masters**

### **California Connections**

#### **California Connections: California's Tire Problem**

Use the copy up front.

## Lesson 1—Visual Aids

**Moving Californians** (Visual Aid #X)

**Design:** Create as a transparency; should be a busy California highway scene. An example is included below.

<http://www.shutterstock.com/pic-6234271-aerial-view-of-complex-highway-interchange-in-los-angeles-california.html>



www.shutterstock.com · 6234271

**Car Tire Dump** (Visual Aid #X)

**Design:** Create as a transparency.



[http://www.cartuningcentral.com/wp-content/uploads/2008/03/passenger\\_car\\_tires.jpg](http://www.cartuningcentral.com/wp-content/uploads/2008/03/passenger_car_tires.jpg)



**Virginia Tire Fire** (Visual Aid #X)  
**Design:** Create as a transparency.



<http://j-walkblog.com/images/4742588.jpg>

**After the Tracy Tire Fire** (Visual Aid #X)  
**Design:** Create as a transparency.



Source: A massive tire fire that started in 1998 still smolders south of Tracy. Rusted, rubberless wheels litter the landscape at the site. Chronicle photo by Paul Chinn.  
<http://www.mindfully.org/Air/Tires-Smoking-2-Years2.jpg>

Tracy Tire Fire (Visual Aid #X)

**Design:** Create as a transparency. Find one or two good photographs.



<https://www.llnl.gov/str/March04/gifs/Vergino3.jpg>

## Lesson 2

### Lesson Title

The Rise of Mass Production

### Introduction

This lesson introduces students to the concepts of mass production and mass consumption as important factors influencing the growth and change of American life during the 1920s. A lecture provides information on inventions of the early 1900s and describes how historical and scientific events combined with available natural resources to fuel the mass production of these new inventions. Students participate in a class discussion and complete a graphic organizer to identify the relationship between science, events, the natural environment, mass production, and mass consumption during the early twentieth century. Students will use this graphic organizer throughout the unit to understand the cycle of mass production and consumption. Students then analyze one mass-produced invention—the automobile—and describe the natural resources required for its manufacturing, the intended and unintended consequences (including byproducts) of manufacturing and using this product, and the associated effects of such activity on natural systems. In the next lesson, students will analyze other mass-produced inventions.

### Background

“Mass production” refers to methods of making large numbers of goods at a low per-cost unit. This does *not* imply low quality. Rather, precision-manufacturing, interchangeable parts, and mechanization standardized the production of goods, achieving high volume, an organized flow of materials through various stages of manufacturing, careful supervision of quality standards, and specialized division of labor.

The nineteenth century development of precision machine tools (and electric motors to run them) to make large numbers of identical parts reliably and cheaply laid the groundwork for mass production. Henry Ford popularized mass production in the early twentieth century by building the Model T using moving assembly lines. Assembly lines enhanced mass production by optimizing the amount of time and skill used to create a finished product. Workers or items moved along a line to collectively assemble a product instead of each worker assembling the product individually. This innovative staffing strategy capitalized on low-skill and high-production work as employees learned simple, repetitive actions that contributed to the building of the final product.

Mass production required mass consumption in order to be profitable, and until the 1920s, the major sources of mass consumption were military units. In times of war, manufacturers found ways to quickly and efficiently mass-produce such products as firearms, ammunition, poison gases, and boots. New technological developments associated with military activities, such as weapons, radios, and airplanes, were soon adapted for civilian purposes and marketed to the public. In addition, inventions that focused on individual needs and time-saving and labor-saving opportunities, such as Band-Aids, wristwatches, and hair dryers, became mass-produced, especially as more homes obtained electricity and indoor plumbing. Manufacturing in America rose 60 to 70% during the 1920s. By the end of the decade, nearly half the population owned cars, radios, and durable consumer goods such as vacuum cleaners and washing machines. As interest in consumer goods increased, the consumption of natural resources and the byproducts created during the production process also increased. Different forms of technology, such as tractors, power tools, and scientific management, used for consumer goods helped make possible the massive expansion of resource extraction and processing.

### EEI Learning Objective

Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems.

**Key Vocabulary**

**Appliance:** A device or instrument designed to perform a specific function, especially a household electrical device, such as a toaster.

**Assembly line:** An arrangement of workers, machines, and equipment so that a product being assembled passes consecutively from operation to operation until completed.

**Mass consumption:** The act or process of consuming in large, or mass, quantities.

**Mass production:** The production of goods in large, or mass, quantities.

**Processed food:** Food altered from its natural state for safety and convenience that is canned, frozen, refrigerated, or dehydrated and aseptic processed.

**Technology:** The application of scientific knowledge for a practical purpose.

## Lesson 2—Toolbox

### Summary of Activities

Students learn about inventions, mass production, and mass consumption, and then summarize basic ideas in a graphic organizer. Using cars as an example, they begin a chart that analyzes the intended and unintended consequences and environmental effects of mass-produced consumer goods.

### Instructional Support

See Extensions & Unit Resources, pages xx-xx.

### Prerequisite Knowledge

#### Students should know about:

- ◆ the transformation of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.

#### Students should be able to:

- ◆ analyze cause and effect.
- ◆ take lecture notes.

### Advanced Preparation

**Gather and prepare Activity Masters.**

**Gather and prepare Materials Needed.**

#### Gather and prepare Visual Aids:

- ◆ prepare transparencies.

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ binder paper, pencils or pens

### Visual Aids

#### Transparencies:

- ◆ **Ford Assembly Line, 1913**, Visual Aid #X
- ◆ **Inventions Timeline**, Visual Aid #X
- ◆ **Car Ad**, Visual Aid #X

### Activity Masters

#### Mass Production Lecture Notes

SM, Pages xx-xx

One per class

**Rise of Mass Production and Mass Consumption**

SM, Pages xx-xx

One per student

**Mass-produced Inventions Chart**

SM, Pages xx-xx

One per student

**Preparation Time**

15 min.

**Instructional Time**

55 min.

**Safety Notes**

None

## Lesson 2—Procedures

### Vocabulary Development

Use the **Key Unit Vocabulary** (Lesson 1 Activity Master) to introduce new words to students as appropriate.

#### Step 1

Remind students that the previous lesson addressed some indirect effects of one invention that emerged during the Roaring Twenties—the automobile tire. Review the lesson by asking students the following questions.

- ◆ What are some indirect effects of car tire manufacturing? (*Disposal of tires is difficult, they take up lots of space in landfills; people dump tires illegally, piles of tires attract mosquitoes; when tire dumps catch fire, the fires can burn for years, causing pollution and harm to the environment.*)
- ◆ Do you think car tire manufacturers intended these effects when they first produced the tires? (*No, they intended for tires to be used for cars and other vehicles.*)

Explain that oftentimes, social or economic progress, change, and growth have unintended consequences that have indirect effects on the environment. Explain that the tire problem resulted from new technologies that emerged during the 1920s and the available natural resources.

#### Step 2

Using the **Key Unit Vocabulary**, familiarize students with the terms “appliance,” “assembly line,” “mass consumption,” “mass production,” “processed food,” and “technology.” Project the transparency **Ford Assembly Line, 1913** (Visual Aid #X). Using Part 1 of **Mass Production Lecture Notes** (Lesson 2 Activity Master), provide students with a brief overview of mass production and the development of the assembly line.

#### Step 3

Tell students that a variety of inventions and new technologies emerged in the early 1900s and after World War 1. Project the transparency **Inventions Timeline** (Visual Aid #X). Review the inventions and timeline with students. During the review, ask students, “Which of these items do you use? How do these items affect your personal lives?”

#### Step 4

Continue the lecture using Part 2 of **Mass Production Lecture Notes**, giving students an overview of the need for natural resources in the production of new products.

Explain that while new technologies and the extraction and transportation of natural resources led to mass production and mass consumer buying, they also affected the environment. The effects on the environment will be explored throughout the unit by considering some of the costs to the environment including:

- ◆ Byproducts from the manufacturing process.
- ◆ Resource conservation and waste management related to product manufacturing and the disposal of products when they stopped working or the consumer decided to replace one item with another.
- ◆ Disposal of the waste materials and alternatives related to conservation, recycling and reuse on resources.

#### Step 5



Distribute copies of **Rise of Mass Production and Mass Consumption** (Lesson 2 Activity Master). Use **Rise of Mass Production and Mass Consumption** to review the information presented in the lecture. Tell students that they will be using this graphic throughout the unit. Instruct students to complete the graphic organizer as you review the information together. Use the Answer Key and Sample Answers on page xx to direct the discussion.

### Step 6

Explain that you will now focus on one new invention of the 1920s, the mass-produced automobile. Project the transparency **Car Ad** (Visual Aid #X), and ask students the following questions.

- ◆ Cars may have been available and affordable to many in the 1920s, but they still cost a lot of money. Why did so many Americans respond to advertisements like this one and purchase automobiles? (*It was new and exciting; made life easier; people wanted to have what others had; they could afford this new invention; they had just finished a war and wanted to live the good life.*)
- ◆ People have continued to buy more cars since the 1920s. How has the automobile affected the lives of Americans since the 1920s? (*People rely on automobiles every day for work, shopping, transportation; people can live farther away from their jobs, people enjoy the variety of cars in different makes and models; we have developed drive-thru restaurants; music and entertainment systems are found in cars; car accidents take lives; many laws have been created to keep people safe in cars.*)
- ◆ What were some of the intended consequences of car ownership? (*Reliable transportation, enjoyment*)
- ◆ What were some unintended consequences? (*Car accidents, development of drive-thru restaurants, interstate freeways*)
- ◆ Besides the problems with tires, what other unintended consequences of the automobile have affected natural systems? (*Air pollution, increased reliance on oil, expansion of roads and interstates, fragmented habitat for wildlife, road kills, abandoned cars, contaminated runoff from car washing and leaking engines, contaminated soil and groundwater from gas station underground storage tank leaks*)

### Step 7

Distribute copies of **Mass-produced Inventions Chart** (Lesson 2 Activity Master). Review the column headings and complete the first row together as a class. Use the Answer Key and Sample Answers provided on page xx to assist in completing the chart. Explain that during the next few classes, students will examine other mass-produced inventions of the 1920s and complete the remainder of the chart.

Collect **Mass-produced Inventions Chart** for use in the next class.

Collect **Rise of Mass Production and Mass Consumption** for use in assessment.

## Lesson 2—Assessment

### Description

**Rise of Mass Production and Mass Consumption** (Lesson 2 Activity Master) assesses students' achievement of the learning objective: "Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems." On this activity master, students identify the relationship between mass production, consumption of natural resources, the rates of consumption of manufactured goods, and the production of byproducts and their effects on natural systems.

### Suggested Scoring

An Answer Key and Sample Answers for **Rise of Mass Production and Mass Consumption** are provided on pages xx-xx. There are 15 total points possible.

## Answer Key and Sample Answers

### Rise of Mass Production and Mass Consumption (Lesson 2 Activity Master)

**Design:** This chart forms the top half of the chart used in Lesson 4: **Mass Production, Marketing, and Consumption in the Roaring Twenties**. Please make the elements of the two charts as much alike as possible.

Name: \_\_\_\_\_

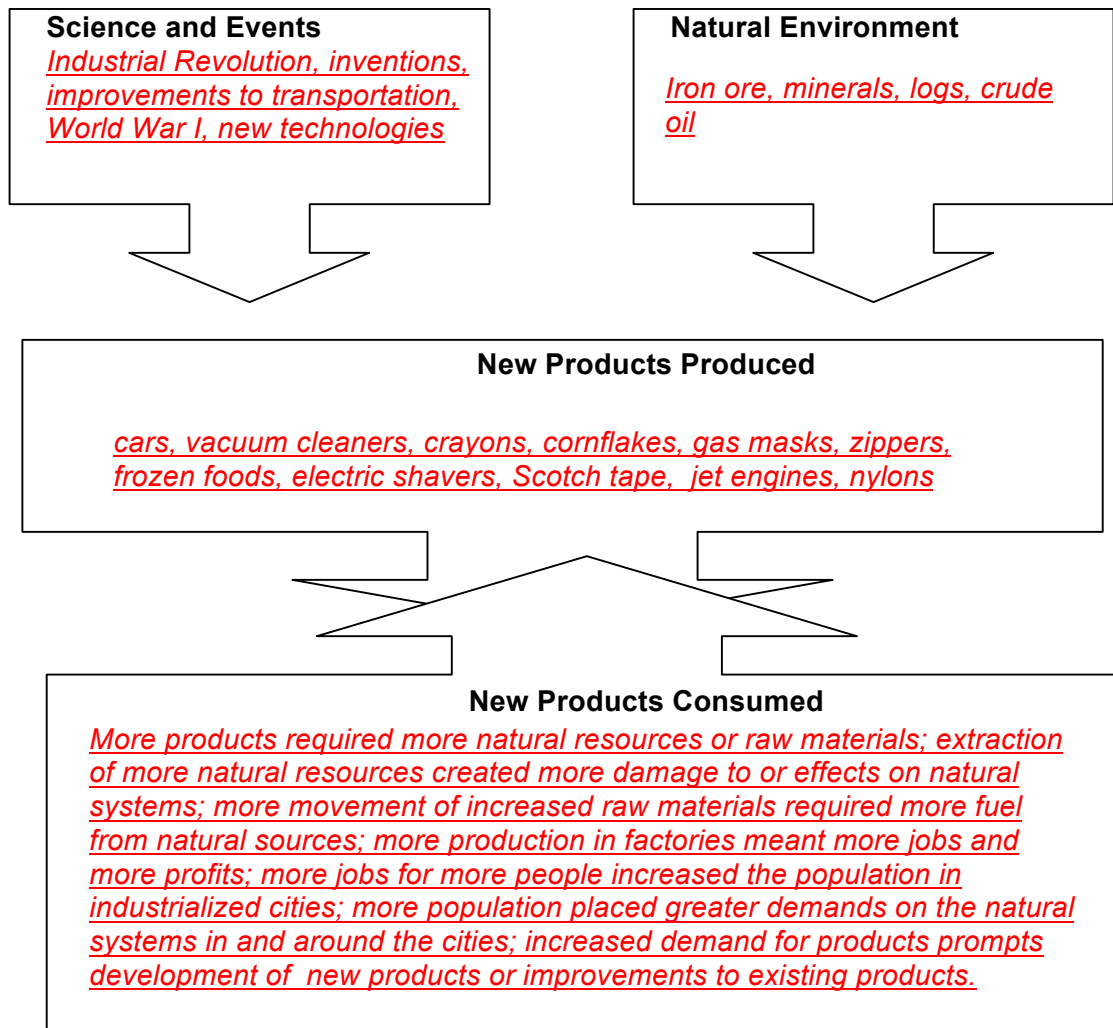
**Directions:** Record the information in the correct boxes.

**Science and Events:** List at least three events or advances in science prior to the 1920s that influenced mass production. (1 point each)

**Natural Environment:** List at least three examples of resources extracted from the natural environment to support mass production. (1 point each)

**New Products Produced:** Identify at least five examples of new products produced in the 1920s. (1 point each)

**New Products Consumed:** Describe how mass consumption affected new product production, science, and events. (2 points) Describe how mass consumption affected the natural environment. (2 points)



## Answer Key and Sample Answers

### Mass-produced Inventions Chart (Lesson 2 Activity Master)

Name: \_\_\_\_\_

#### Day 1

**Directions:** Complete the row for the automobile with the class.

#### Day 2

**Directions:** Complete the row for your group's invention. Complete the remaining rows as you take notes from other groups. (20 points)

Mass-produced Invention	Natural Resources Required for Production in 1920s	Intended Consequences	Unintended Consequences (including byproducts)	Effects on Natural Systems (good, bad, neutral)
Automobile	<u>Aluminum, carbon, copper, iron ore, lead, magnesium, manganese, nickel, petroleum, quartz sand, rubber, silicon, textiles (cotton, animal skins), zinc ore</u>	<u>Reliable transportation, enjoyment, ease of moving people and goods, improve quality of life</u>	<u>car accidents, need for car insurance, reliance on oil, air pollution, junkyards for car/parts disposal, drive-thru restaurants</u>	<u>air pollution, water pollution, soil pollution, oil drilling, depleting nonrenewable energy sources, road-building, less dusty roads after paving</u>
Alarm Clock	<u>Metal, glass, ink, or resources to make paint</u>	<u>Keep time, allow people to be on time, allow people to wake up on time</u>	<u>Scrap metals as byproducts from production, disposal of clocks for new models</u>	<u>Mining of metals, disposal of metals in landfills</u>
Camera	<u>Metal, glass, leatherette (paper, cotton), resources to make film</u>	<u>Take photos; provide records and memories</u>	<u>Chemicals needed for processing photos, lots of paper used for photos</u>	<u>Cameras record images of natural systems; mining of metals</u>
Canned Food and Beverages	<u>Tin, steel iron, food (vegetables, fruit, juice, ginger ale, meat)</u>	<u>Preserve food; keep food safe from spoiling; transport food easily and safely</u>	<u>Diets changed to adjust to canned foods, disposal of many cans</u>	<u>Mining of metals, disposal in landfills</u>
Lightbulb	<u>Glass, metal,</u>	<u>Controllable</u>	<u>Consumes</u>	<u>Safer than</u>

<b>(incandescent)</b>	<u>tungsten, inert gas (argon, neon, nitrogen)</u>	<u>light in homes and businesses, affordable resource</u>	<u>large amounts of energy, contributes to global climate change</u>	<u>candles/fire, conserves firewood, high consumption of energy, contributes to global climate change</u>
<b>Telephone</b>	<u>Wood or zinc alloy, metal, carbon</u>	<u>Allow people to communicate; people can give or get help in emergencies</u>	<u>Telephone lines to connect system, conversion to plastics, disposal for new models</u>	<u>Wood used to build telephone poles, metals used for telephone lines, lines across landscapes</u>

**Directions:** When you have completed the chart, answer the following question. (4 points)

What was the role of marketing and credit in the production and purchase of consumer goods in the 1920s?

In the 1920s, manufacturers started to market their products to the public. They used advertisements to influence consumers to buy their products by trying to convince them that the products would improve the quality of their lives. Paying by installments or using credit allowed consumers to purchase items even if they did not have money at that time. Using credit, consumers could buy items and pay later. Marketing and credit allowed more consumers to buy products, which then stimulated the demand for more products.

## Lesson 2—Activity Masters

### Mass Production Lecture Notes (Lesson 2 Activity Master)

#### Part 1: Mass Production and the Assembly Line

In the 1920s, a new process called “mass production” helped to make automobiles more available and affordable. Mass production, which is the manufacturing of goods in large, or mass, quantities, is associated with factories and an innovation called the “assembly line.”

- ◆ In this system, tracks or conveyor belts move partially completed products through a series of worker stations.
- ◆ At each station, the workers perform one or more tasks that contribute to the development of that product. For example, in building a car, the task might involve installing a steering wheel or mounting tires.
- ◆ This system allows for a high rate of production because the product keeps moving and only stays at each station long enough to have the assigned tasks performed.
- ◆ Workers' stations match their training and abilities.
- ◆ Each worker contributes to a part of the assembly process.
- ◆ This process standardizes the product, and consumers can count on the products all being the same in the end, unless a mistake occurs on the assembly line.
- ◆ This system also keeps costs low for the manufacturer.
  - Rather than paying high salaries to skilled, experienced workers who specialize in making complete products, mass production breaks down the job into smaller parts that do not require as much skill or experience.
  - In the end, workers make more products at a faster rate and for less cost. The low cost and the large number of products keep the price lower than it would be if each product were produced individually.

#### Part 2: Mass-Produced Inventions and the Need for Natural Resources

While some inventions appeared before World War I (WWI), for example, tractors and vacuum cleaners, many were not widely produced and used by the public until years later. After WWI ended, new inventions emerged. Improvements in transportation systems made before the war allowed raw materials to be moved more easily and more products to be made.

- ◆ Materials needed for production could be moved to industrialized cities.
- ◆ Manufacturers could produce items in places far from the natural resources required to make them.
- ◆ Examples of raw materials transported include iron ore, minerals, logs, and crude oil.
- ◆ Car manufacturers transported aluminum, carbon, copper, iron ore, lead, magnesium, manganese, nickel, petroleum, quartz sand, silicon, and zinc ore to the factories that manufactured cars.
- ◆ Improved transportation systems moved products made in industrialized cities to consumer markets all around the world.
  - Consumers did not have to go to Michigan, where Henry Ford made Model Ts on an assembly line, in order to buy a car.
  - After building the car, the manufacturers would ship their products to places around the world where people could buy them close to their homes.
- ◆ Other mass-produced items included clocks, watches, weapons, processed foods, and various household appliances.
- ◆ The more available, affordable, and convenient the products were for the consumers, the more these products were socially desirable for consumers to purchase.
- ◆ Mass production led to mass consumption.

## Lesson 2—Visual Aids

**Ford Assembly Line, 1913** (Visual Aid #X)

**Design:** Create as a transparency.

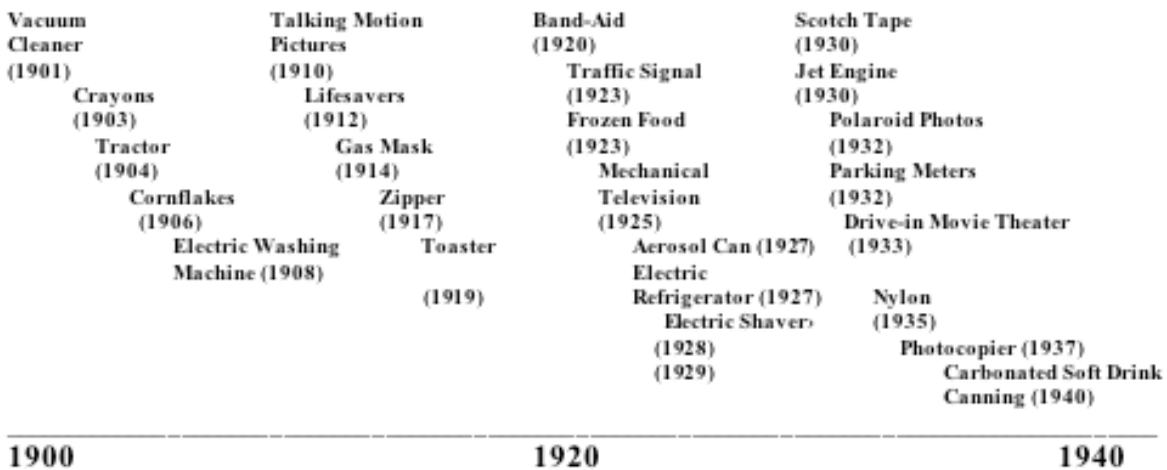


## Inventions Timeline (Visual Aid #X)

**Design:** Create as a transparency. Use words and dates. If possible, include photos or icons to increase interest.

Lesson 2 Visual Aid

### Inventions Timeline



|  
Add to timeline: **Carbonated soft drink canning begins (1940)**



## Car Ad (Visual Aid #X)

**Design:** Create as a transparency.

June, 1914

THE LITTLE HOME JOURNAL



*Get all the  
Joy out of  
June*

Every woman who loves Nature—and what woman does not!—should enjoy all the “rare days” of this perfect month in the open air.

With a Ford car at her disposal she can revel in June air and scene to her heart's content. Distance is covered and her time and strength conserved.

For not only is a Ford car pre-eminently dependable and easy for any woman to handle, but its economy prevents all worry as to expense—either of original cost or upkeep.

FORD MOTOR COMPANY, DETROIT, MICHIGAN

Runabout - \$240	Coupe - \$320	Fordor - \$660
Touring - \$290	Tucker - \$380	

The Open Car's Superior and Unsurpassable Ride are 100 Extra  
Full size Bulletin Your Agent—Send Large Reply Open Car 140

**Ford**  
THE UNIVERSAL CAR

MAKE SAFETY YOUR RESPONSIBILITY

[http://www.thelabelman.com/product\\_info.php?cPath=58\\_70&products\\_id=57&osCsid=64276d49a09114287608e1e953567d6e](http://www.thelabelman.com/product_info.php?cPath=58_70&products_id=57&osCsid=64276d49a09114287608e1e953567d6e)

## Lesson 3

### Lesson Title

#### A Rise in Mass Consumption

### Introduction

Mass production is only successful and financially sustainable if consumers respond with mass consumption. In this lesson, students learn how marketing and credit stimulated demand for products and how investments promoted the development of new and improved products to meet consumer demand. Students examine a chart depicting the cyclical relationships between mass consumption and mass production. They discuss how increased production and consumption increased the demand for the natural resources needed for product development. Increased demand for natural resources affected natural systems both immediately and long-term.

Working in small groups, students read about mass-produced items and analyze advertisements from the 1920s featuring those items. Students identify natural resources used to produce the items, the intended and unintended consequences of the products, their effects on the environment, and the advertising concepts used to promote them. Students share and compile their findings in a chart and write about the role of marketing and credit in the production and purchase of consumer goods in the 1920s.

### Background

The 1920s saw a rapid acceleration of the cycle of mass production and consumption. Why did the consumption of new products increase so quickly? Two factors responsible for this rapid expansion remain part of the U.S. economic landscape today—credit and advertising.

Economist Thorstein Veblen published *The Theory of the Leisure Class* in 1898. The book reached a wide U.S. audience during the 1920s because it spoke directly to the psychology of U.S. consumption: Americans wanted to get rich, and to do so with little effort. Veblen introduced the now-familiar term "conspicuous consumption," which seemed to embody the cultural mindset of post-World War I America. Conspicuous consumption describes lavish spending on goods acquired mainly for displaying wealth.

The list of goods produced and consumed in mass quantities during the 1920s is extensive. Some examples include the radio, automobiles, new electrical appliances, processed foods, and the frequent purchase of tickets to motion pictures. Annual automobile production rose from 2 million during the early 1920s to 5.5 million in 1929. Advertising promoted the popularity of the car, and credit made the car more affordable to working-class families. Although the cost of automobiles decreased due to mass-production techniques, approximately 75% of consumers in 1925 used installment plans to purchase cars.

While advertising in America dates back to colonial times, advertising volume grew from \$200 million in 1880 to nearly \$3 billion in 1920. National advertising of branded goods grew with the rise of department stores, the expansion of mail-order catalogues, and the increase in mass-circulation magazines. People began to recognize branded products and purchase them—first in cities and eventually throughout the country. Advertisements promoted goods to engage Americans in leisure-time activities such as movies and sports, and they encouraged the celebration of prosperity through the acquisition of material goods. Marketing campaigns sought to convince hardworking Americans that they needed and deserved the many new products being mass-produced.

### EEI Learning Objectives

Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems.

Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).

### **Key Vocabulary**

**Advertising:** The activity of attracting public attention to a product or business, as by paid announcements in the print, broadcast, or electronic media.

**Credit:** A contractual agreement in which a borrower receives something of value now, with the promise to repay the lender at some date in the future.

**Cycle:** An interval of time during which a characteristic, often regularly repeated event or sequence of events occurs.

**Demand:** (noun) Quantity of a good or service that consumers are willing to purchase from producers at a given price.

**Investment:** A monetary asset purchased with the idea that the asset will provide income in the future or appreciate and be sold at a higher price.

**Marketing:** A process associated with promoting goods or services for sale.

## Lesson 3—Toolbox

### Summary of Activities

Students use a chart to explore the rise of mass production and mass consumption. In small groups, they discuss ads from the 1920s and compile information about several products. Students analyze ads for advertising concepts and write about the influence of marketing.

### Instructional Support

See Extensions & Unit Resources, **pages xx-xx**.

### Prerequisite Knowledge

#### Students should know about:

- ◆ the transformation of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.
- ◆ the significant inventors and their inventions from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, and how they improved the quality of life.

#### Students should be able to:

- ◆ draw upon prior knowledge and experience to analyze goods for their intended and unintended uses as well as materials used to develop the product.
- ◆ analyze advertisements for information and interpretation.

### Advanced Preparation

#### Gather and prepare Activity Masters:

- gather from previous lessons:
  - **Rise of Mass Production and Mass Consumption** from Lesson 2.
  - **Mass-produced Inventions Chart** from Lesson 2.

#### Gather and prepare Materials Needed.

#### Gather and prepare Visual Aids:

- ◆ prepare transparencies.
- ◆ gather from previous lessons:
  - **Car Ad**, Visual Aid **#X**.

#### Write the following discussion questions on the board:

- ◆ What do you see in this advertisement?
- ◆ What does the text say?
- ◆ How does the advertisement make you feel?
- ◆ What do you think about when you see this advertisement?

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ chalk or dry-erase markers, pencils or pens.

**Visual Aids****Photo Cards:**

- ◆ **Camera Ad**, Visual Aid #X
- ◆ **Phone Ad**, Visual Aid #X
- ◆ **Alarm Clock Ad**, Visual Aid #X
- ◆ **Canned Food Ad**, Visual Aid #X
- ◆ **Lightbulb Ad**, Visual Aid #X

**Transparencies:**

- ◆ **Mass Production and Consumption Cycle**, Visual Aid #X
- ◆ **Advertisement Guiding Questions**, Visual Aid #X

**Activity Masters****Inventions Information Sheet**

SM, Pages xx-xx

One per student

**Preparation Time**

10 min.

**Instructional Time**

55 min.

**Safety Notes**

None

## Lesson 3—Procedures

### Vocabulary Development

Use the **Key Unit Vocabulary** (Lesson 1 Activity Master) to introduce new words to students as appropriate.

#### Step 1

Review information from the previous lesson by asking the following questions.

- ◆ What is mass production? (*The production of goods in large, or mass, quantities.*)
- ◆ What is mass consumption? (*The act or process of consuming in large, or mass, quantities.*)
- ◆ What led to the rise of mass production? (*Scientific inventions/new technologies, Industrial Revolution, World War I, better transportation systems, available raw materials from the natural environment*)
- ◆ What led to mass consumption? (*Mass production, available and affordable products*)
- ◆ What were some effects of mass consumption? (*Increased demand for products and profits; more extraction of natural resources to meet demands; more inventions to improve products or create new products; more jobs for workers in industrialized cities; larger city populations; increased demands on natural systems in and around cities.*)

Return students' **Rise of Mass Production and Mass Consumption** (Lesson 2 Activity Master) to use as a reference throughout the remainder of the unit.

#### Step 2

Using **Key Unit Vocabulary**, introduce students to the terms “advertising,” “credit,” “cycle,” “demand,” “investment,” and “marketing.” Project the transparency **Mass Production and Consumption Cycle** (Visual Aid #X). Have students examine this cycle independently, and then turn to a partner to explain the cycle to each other. After a few minutes, have volunteers share their explanations with the class. (*New products are produced→ consumers buy and use these products→ marketing and credit prompt consumers to demand more products→ investors influence the development of more/better products→more products are produced, and the cycle repeats itself.*) Correct any misconceptions.

#### Step 3

Referring to the transparency **Mass Production and Consumption Cycle**, explain to students that marketing and credit stimulated the demand for more products. Marketing and advertising introduced new products to people and often influenced them to believe that their lives would be better with these items. The introduction of credit allowed interested consumers to borrow money to make their purchases with the promise to repay the funds later (often with interest added). Credit was further refined in the 1920s with the advent of “installment plans,” which made use of credit very attractive to consumers.

#### Step 4

Continue to explain to students that investments fueled the development of new products in the areas where consumer demand was the greatest. Investors provided money to manufacturers for product research, development, and production. When the product sold, the manufacturers returned a percentage of those sales to the investors. Some investors made a lot of money this way!

#### Step 5

Return students' **Mass-produced Inventions Chart** (Lesson 2 Activity Master). Review the chart headings and the example of the automobile.

Organize the class into five small groups. Distribute one **Photo Card** to each group: **Camera Ad** (Visual Aid #X), **Phone Ad** (Visual Aid #X), **Alarm Clock Ad** (Visual Aid #X), **Canned Food Ad** (Visual Aid #X), or **Lightbulb Ad** (Visual Aid #X). Distribute copies of **Inventions Information Sheet** (Lesson 3 Activity Master) to each student.

Explain that each advertisement shows a mass-produced and mass-consumed invention from the 1920s. Instruct each group to analyze and discuss the item advertised in their group's photo card. Project the transparency **Advertisement Guiding Questions** (Visual Aid #X) and have students use these guiding questions in their group discussions.

Instruct students to answer these questions as a group, and refer to the **Inventions Information Sheet** as necessary. Tell students that they should each complete the row on their copy of **Mass-produced Inventions Chart** that matches the advertisement their group received. Allow 10 minutes for this activity.

### Step 6

Have one member from each group briefly report the group's findings to the class while the rest of the class takes notes to complete their individual **Mass-produced Inventions Chart**. Have students direct questions about each invention to group members. Encourage students to add their insights or background knowledge about any of the inventions presented by other groups. *(Note: Make sure that each group addresses the issues of waste generated in the manufacturing and disposal of these items.)*

### Step 7

Facilitate a discussion about the information presented and accumulated on the chart. Ask students, "What were the physical effects on natural systems of manufacturing and selling thousands of these items beginning in the 1920s? *(Many natural resources were used, even depleted in some areas; mining, factory building, and transportation of goods altered natural environments; chemical byproducts were released in soil, water, and air; landfills received more waste as items were discarded.)*

### Step 8

Project the transparency **Car Ad** (Visual Aid #X). Refer students to the questions written on the board, and initiate a class discussion based on the questions.

- What do you see in this advertisement? *(A woman getting into or out of a car; a nice shiny car; a man bringing fruit or items in a box to the car; a fruit/vegetable stand in the background; a nice house; green trees; quiet road.)*
- What does the text say? *(Read from ad.)*
- How does the advertisement make you feel? *(Carefree; calm, relaxed; happy for the people in the ad)*
- What do you think about when you see this advertisement? *(What a nice atmosphere; perhaps this is the country; summer is meant for enjoyment and relaxation; these women are probably friends; women can drive cars; cars make it possible to get out and enjoy nature.)*

### Step 9

Tell students that advertising and marketing connected mass production to mass consumption in the 1920s. Have students in their groups look again at their **Photo Cards** and use the questions on the board to analyze and discuss the advertisement. Instruct students to write a brief response to the question at the bottom of **Mass-produced Inventions Chart**.

### Step 10

Return to the transparency **Mass Production and Consumption Cycle** and have a volunteer explain the cycle again. Close the lesson by reiterating that marketing, advertising, and credit were powerful tools used to sell mass-produced goods to the American public in the 1920s, and they remain an effective strategy today.

Collect **Mass-produced Inventions Chart** for use in assessment.



### Lesson 3—Assessment

#### Description

**Mass-produced Inventions Chart** (Lesson 3 Activity Master) assesses students' achievement of the learning objectives: "Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems;" and "Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials)." On this activity master, students identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may affect natural systems. They also provide examples of the direct and indirect effects of new technologies on natural systems..

#### Suggested Scoring

An Answer Key and Sample Answers for **Rise Mass-produced Inventions Chart** are provided on pages xx-xx. There are 24 total points possible.

Check this: I moved the answers for this chart to Lesson 2, where chart first appears. I left the **Mass-produced Inventions Chart, Part 2 Scoring Tool** for scoring the final question here in this lesson.

#### Scoring Tool

##### Mass-produced Inventions Chart, Part 2 Scoring Tool

4	Student demonstrates an understanding of the concepts of marketing and credit. Student accurately explains the role of marketing and credit as stimulating the purchase and production of consumer goods in the 1920s.
3	Student describes the role of marketing and credit as stimulating the purchase and production of consumer goods in the 1920s.
2	Student describes marketing and credit. or Student describes that role of marketing and/or credit in the 1920s.
1	Student states that marketing and credit stimulated the production and purchase of consumer goods in the 1920s.

## Lesson 3—Activity Masters

### Inventions Information Sheet (Lesson 3 Activity Master)

**Design:** Create as an Activity Master. Include a small photograph or icon to represent each invention.

**Directions:** Use the information provided to help you complete **Mass-produced Inventions Chart** (Lesson 2 Activity Master).

#### Alarm Clock

Instruments and methods for keeping time are some of the oldest of human inventions. A clock is a modern example of a tool that monitors or tracks time. In 1876, the Seth Thomas Clock Company received a patent for a new kind of clock, a small bedside alarm clock. Small alarm clocks became popular, and major U.S. clock companies started making them. Manufacturers improved the small clock construction, and by the 1920s, they mass-produced and marketed the clocks as an essential appliance for every home.

The clocks contained a complex system of metal gears, alarm bells, hands, mounting rings, and knobs. A glass lens enclosed the metal hands, which points to printed or painted numbers on a metal face. In the 1920s, clocks were wound using thin metal strands. Today's alarm clocks operate on batteries, electricity, or solar power.

#### Camera

Cameras allow people to take photos of objects by working with light. Cameras generally consist of an enclosed hollow with an opening at one end for light to enter. Most cameras have a glass lens positioned in front of the camera's opening to gather the incoming light and focus all or part of the image on a recording surface at the other end of the camera.

The first small, portable camera for photography was built by Johann Zahn in 1685, but it would be almost 150 years before technology caught up to the point where this was practical. Early photographic cameras were similar to Zahn's model, but usually with the addition of sliding boxes for focusing. Before each exposure, the photographer had to insert a sensitized plate in front of the viewing screen to record the image.

In the 1920s, the box camera was popular. These box cameras were mass-produced with inexpensive glass optics and metal covered with leatherette. Leatherette is a kind of imitation leather made of paper, cloth, or plastic. The entire back of the camera opened to insert and remove the film, which was loaded onto a chrome rail and rolled onto a metal screw.

#### Canned Food

Canning is a method of preserving food by processing it and sealing it into an airtight container, which is usually metal. The French military first developed this process as a way of protecting food from spoiling. As the canning process was mechanized and urban populations grew throughout Europe, demand for canned food increased. Inventions brought improvements to the process. In 1812, the first U.S. canning factory in New York City used improved tin-plated wrought-iron cans for preserved oysters, meats, fruits, and vegetables. Demand for canned foods increased during wars and skyrocketed during World War I.

Today, tin-coated steel is the material most commonly used for canned foods.

#### Lightbulb

Considered to be one of the most life-changing inventions in human history, the electric lightbulb affects our everyday lives and makes many nighttime activities possible. While earlier experiments in electric lighting are documented, Thomas Alva Edison is credited with the

development the “incandescent lamp,” or lightbulb, in 1879. As electricity became more available in the early 1900s, the demand for and production of lightbulbs increased.

The incandescent lightbulb provides electric light through incandescence, or heat-driven light emissions. An electric current passes through a thin filament—a thread of metal, which is usually tungsten—heating it until it produces light. A glass globe encloses the filament and prevents the oxygen in air from reaching the hot filament, which would destroy it. Incandescent lightbulbs are made of glass, tungsten wire, small wires, and metal sleeves. Low-pressure inert gas, usually argon, neon, or nitrogen, fills the glass globe.

Due to the high energy usage of incandescent lightbulbs, more energy-efficient alternatives have been developed recently, for example, compact fluorescent lamps and LED lamps. Some governments have passed laws to phase out the use of incandescent lightbulbs. Brazil and Venezuela began to phase them out in 2005. Other nations have scheduled phase-outs: Ireland and Switzerland in 2009, Italy in 2011, Canada in 2012, and the United States between 2012 and 2014. As a result, efforts to improve the efficiency of incandescent lamps are being made. General Electric has announced work on “high efficiency incandescent” (HEI) lamps, which are expected to be four times as efficient as current incandescent lamps.

### **Telephone**

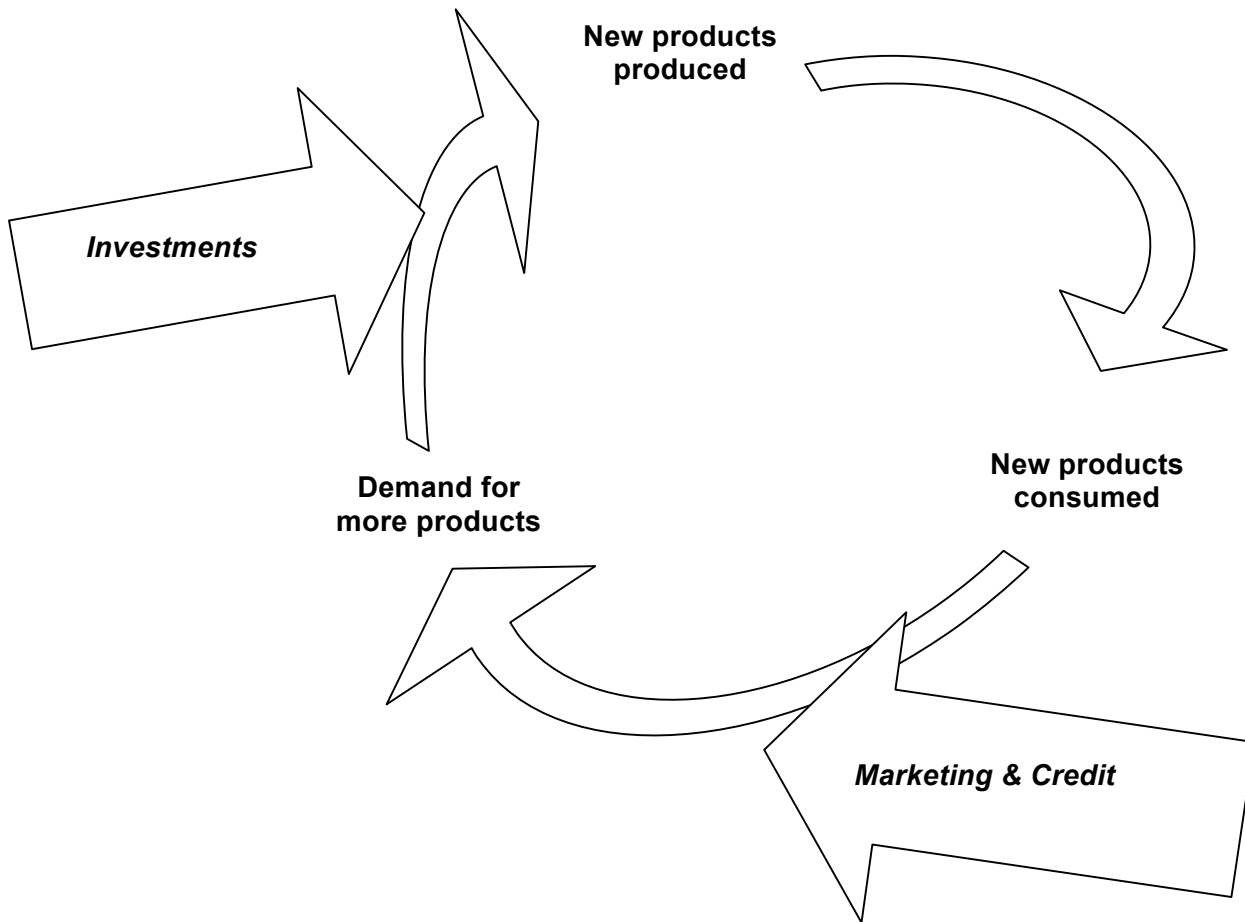
Alexander Graham Bell was credited with the invention of the telephone, although many other inventors claimed this invention as their own. Between 1844 and 1877, several versions of a device that transmits and receives sound were created, using various materials to transmit sound. In 1877, Thomas Edison received a patent for his carbon transmitter. He set up the first telephone system, called an exchange, in New Haven, Connecticut, in 1878. In this exchange, people with telephones could communicate through operators working at a switchboard. In 1923, the first rotary dial telephone was developed in France.

As telephone systems and telephones for home use improved, they were mass-produced for consumers. Rotary dial telephones manufactured in the 1920s were made of wood or zinc alloy (changed to thermoplastic in 1941), carbon microphones, metal bells and parts, iron, wires, and magnets.

### Lesson 3—Visual Aids

**Mass Production and Consumption Cycle** (Visual Aid #X)

**Design:** Create as a transparency.



### Lesson 3—Visual Aids

#### Advertisement Guiding Questions (Visual Aid #X)

**Design:** Create as a transparency.

- What is the item being advertised?
- What was its intended use or function?
- Who would use this item in the 1920s?
- Who uses this item today? Has the intended use or function changed since the 1920s?
- What natural resources were used to produce this item?
- What was the effect on natural systems to make this item, use this item, and dispose of this item?
- Have the materials used to make this item changed since the 1920s? If so, what has changed and why? Do these changes alter the effects of this item on natural systems?

Alarm Clock Ad (Visual Aid #X)  
Design: Create as a photo card

THE SATURDAY EVENING POST

# Westclox

*As dependable as they  
are good looking*

... You may be sure of that—they are precision-built Westclox; distinguished for their reliability.

Westclox in color—priced the same as nickel finish—include Big Ben De Luxe and Baby Ben De Luxe—famous alarms—in old rose, blue or green; beautiful hues to match the color scheme of any room. And in the same charming colors there's Tiny Tim—without alarm—a handy little timepiece for home, office or travel.

Sold everywhere by  
jewelers, druggists, hardware and department stores  
Prices slightly higher in Canada

**WESTERN CLOCK COMPANY**  
La Salle, Illinois, U. S. A.  
Factory: Peoria, Illinois.  
In Canada: Western Clock Company, Limited,  
Peterborough, Ont.

**Ben Hur**, the popular \$2.50 Westclox alarm, is also made in colors. There's a variety of other Westclox, finished in lustrous nickel—plain or luminous dials. Prices range from \$1.50 to \$5.00.

**Big Ben De Luxe**  
\$3.75

**Baby Ben De Luxe**  
\$3.75

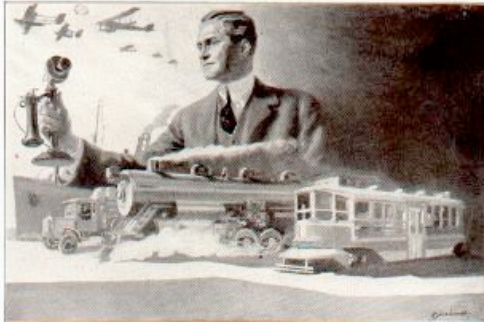
**Tiny Tim**  
\$2.50

Saturday Evening Post, October 27, 1928

Illustrates crackle green Tiny Tim, crackle blue Big Ben and crackle pink Baby Ben clocks.  
<http://clockhistory.com/westclox/company/ads/1925/10-27-28-sp.htm>

Phone Ad (Visual Aid #X)

Design: Create as a photo card



## The Measure of Progress

The progress of the past, as well as that of the future, is measured by criticism—for criticism exists only where there is faith in ability to improve.

We do not criticise an ox cart or condemn the tallow dip, for the simple reason that they are obsolete. During the reconstruction period through which our country is now passing, if the public does not criticise any public utility or other form of service, it is because there

seems little hope for improvement.

The intricate mechanism of telephone service is, under the most favorable conditions, subject to criticism, for the reason that it is the most intimate of all personal services.

The accomplishment of the telephone in the past fixed the quality of service demanded today; a greater accomplishment in quality and scope of service will set new standards for the future.



AMERICAN TELEPHONE AND TELEGRAPH COMPANY  
AND ASSOCIATED COMPANIES

*One Policy*

*One System*

*Universal Service*

"Mention The Geographic—It identifies you!"

[http://www.myinsulators.com/commokid/telephones/1920s\\_telephone\\_ads.htm](http://www.myinsulators.com/commokid/telephones/1920s_telephone_ads.htm)



Camera Ad (Visual Aid #X)

Design: Create as a photo card

30 *The Ladies Home Journal for March 1908*



**Let the Children Kodak**

And then in turn Kodak the children. In every home, on every vacation trip, there's a story for the Kodak to record. But above all is the serial story of the children, from the days of wild gallops across the nursery floor upon the fractious rocking-horse to the foot ball days; from the days of tending dollies to the graduation days.

And it's all a simple story to record, for the Kodak system of photography has removed most of the opportunities for making mistakes. It's inexpensive now and there's no dark-room for any part of the work.

**KODAK Means Photography  
With the Bother Left Out.**

Kodaks, \$5.00 to \$100.      Brownie Cameras, \$1.00 to \$12.00.

**EASTMAN KODAK CO.**

Catalog free at the dealers or by mail.      ROCHESTER, N. Y., The Kodak City.

[http://www.thelabelman.com/product\\_info.php?cPath=58\\_72&products\\_id=422&osCsid=64276d49a09114287608e1e953567d6e](http://www.thelabelman.com/product_info.php?cPath=58_72&products_id=422&osCsid=64276d49a09114287608e1e953567d6e)

or





## A Page of Brownies

These pictures were made on  
Kodak film with a two-dollar  
Brownie camera

*A story that never grows old is the picture story of the children—your children. To-day it is filled with the charm of human interest. To-morrow, when the children have outgrown childhood, it holds you fast—brings back again and again, as you pore over the pages of your snap-shot album, the vivid story of the children as they were.*

*And picture taking is very simple with a Brownie camera. The No. 0 Brownie, with which these pictures were made, loads in daylight with Kodak film cartridges for eight exposures  $1\frac{1}{2} \times 2\frac{1}{4}$  inches. It has a fixed focus, a rotary shutter for snap-shots or time exposures and two finders, one for upright and one for horizontal pictures. It's a sturdy little camera, well finished, and the films cost (including war tax) but 25 cents for eight exposures.*

*Let your dealer show you how easy it is to have pictures of the children and by the children—natural, informal snap-shots of the youngsters just as they are—pictures that cost but a few cents each, yet are a delight today, and to-morrow will fill a priceless album.*

EASTMAN KODAK COMPANY

ROCHESTER, N. Y., The Kodak City



The No. 0 Brownie  
Price, \$2.00



Showing the original No. 0 Brownie size and an enlargement from the same negative. Enlargements made with this camera are of such quality that enlargements can easily be made up to this size (just over 4x6). The price of such enlargements is 50 cents each.



[http://www.brownie-camera.com/posters/pages/047\\_1921.shtml](http://www.brownie-camera.com/posters/pages/047_1921.shtml)

## Lightbulb Ad (Visual Aid #X)

Design: Create as a photo card



[http://www.thelabelman.com/product\\_info.php?cPath=58\\_72&products\\_id=1134&osCsid=64276d49a09114287608e1e953567d6e](http://www.thelabelman.com/product_info.php?cPath=58_72&products_id=1134&osCsid=64276d49a09114287608e1e953567d6e)

**Canned Food Ad (Visual Aid #X)**  
**Design: Create as a photo card**



[http://www.thelabelman.com/product\\_info.php?cPath=58\\_78&products\\_id=458&osCsid=64276d49a09114287608e1e953567d6e](http://www.thelabelman.com/product_info.php?cPath=58_78&products_id=458&osCsid=64276d49a09114287608e1e953567d6e)



<http://gono.com/museum2003/history%20of%20cans/history%20of%20cans.htm>

## Lesson 4

### Lesson Title

Changing the American Landscape

### Introduction

In this lesson, students explore the direct and indirect influences of mass production and mass consumption on the American landscape. First, students view and discuss artwork from the 1920s that portray mostly natural American landscapes. Students then view a new graphic that combines the graphic organizers from Lesson 2 and 3, adding the component of byproducts and waste to the cycle of mass production and consumption. Students fill in the new graphic while listening to a lecture that explores the relationship evolving between growing cities and natural systems due to the cycle of mass production, marketing, and consumption. This prepares students to complete the graphic again in Lesson 5 for a specific product. To see the effects of consumption on the American landscape, students then compare one of the 1920s landscapes with a painting from 1940. Students then write about the direct or indirect influences brought to the American landscape through the changes of the 1920s.

### Background

At the beginning of the 1920s, Americans were transitioning from a wartime economy to a peacetime economy. Weapon building was no longer necessary, and soon production resources—processes, facilities, workers, and innovations—had refocused on serving U.S. consumers. New businesses and new jobs developed to accommodate new inventions, new means of production, and lifestyle changes. The middle class grew as the United States prospered. During this decade, our country became the richest nation on Earth, and consumerism was born.

Many people went to work and many earned good pay, usually about five dollars per day. This, of course, depended on what you did and where you lived. For many Americans (not all), this was a time of relative prosperity. This allowed them to spend money on buying homes, taking vacations, and “living the good life” through music, movies, leisure reading, and shopping. Department stores developed. Their electric lighting and plate-glass windows enticed consumers with a wide variety of goods for sale. Consider Macy’s in Herald Square in New York City. Opened as a “bazaar” in 1878, Macy’s moved to its present site in 1902 and doubled in size in 1924. By the end of the 1920s, it had become the country’s largest department store.

The construction of homes, stores, and other buildings stimulated the economy with jobs for carpenters, electricians, and plumbers. The growth of cities and expansion of suburbs changed the physical landscape with new buildings and paved roads. With the new cars came jobs for car dealers, gas station attendants, mechanics, workers for roadside motels, and cooks for roadside diners. More jobs brought increased income and spending.

Radios and film brought people together even more, and helped develop a “national identity” forged around common experiences. Part of this identity promoted the introduction of time-saving appliances, such as washing machines, which eliminated the need to hand-wash clothes; refrigerators, which eliminated the need to go to the market daily; and vacuum cleaners, which were more efficient than brooms. However, use of such modern conveniences came at a price. Air pollution, water contamination, and waste accumulation became issues for modern society.

### EEI Learning Objective

Describe the direct and indirect influences of growing cities on the American landscape and the associated natural systems.

**Key Vocabulary**

**American landscape:** 1. The visible features of the land in the United States 2. In cultural geography, the human social systems and culture of the United States.

**Department store:** A large retail store offering a variety of merchandise and services and organized in separate departments.

**Human social systems:** The basic functions, processes, and interactions among individuals, human communities, and societies.

**Landscape:** 1. The visible features of an area of land 2. A picture depicting an expanse of scenery.

**Lifestyle:** A way of life or style of living that reflects the attitudes and values of a person or group.

**Suburb:** A usually residential area or community outlying a city.

## Lesson 4—Toolbox

### Summary of Activities

Students discuss scenes depicting American landscapes in the 1920s, learn about lifestyle changes based on mass production and consumption, and complete a graphic about the relationships between the cycle of production and consumption and natural systems.

### Instructional Support

See Extensions & Unit Resources, pages xx-xx.

### Prerequisite Knowledge

#### Students should know about:

- ◆ patterns of agricultural and industrial development as they relate to climate, use of natural resources, markets, and trade.
- ◆ the location and effects of urbanization, renewed immigration, and industrialization.

#### Students should be able to:

- identify natural systems.
- take lecture notes.

### Advanced Preparation

Gather and prepare Activity Masters.

Gather and prepare Materials Needed.

#### Gather and prepare Visual Aids:

- ◆ prepare transparencies.

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ chalk or dry-erase marker, pens or pencils

### Visual Aids

#### Photo Cards:

- ◆ American Landscape, Visual Aid #X
- ◆ Carmel River, 1920, Visual Aid #X
- ◆ Autumn Landscape, Visual Aid #X
- ◆ Gas, 1940, Visual Aid #X

#### Transparencies:

- ◆ Mass Production, Marketing, and Consumption in the Roaring Twenties, Visual Aid #X

### Activity Masters

**Mass Production, Marketing, and Consumption in the Roaring Twenties**

SM, Pages xx-xx

One per student

**Changing the American Landscape Lecture Notes**

SM, Pages xx-xx

One per class

**Preparation Time**

10 min.

**Instructional Time**

55 min.

**Safety Notes**

None



## Lesson 4—Procedures

### Vocabulary Development

Use the **Key Unit Vocabulary** (Lesson 1 Activity Master) to introduce new words to students as appropriate.

#### Step 1

Using the **Key Unit Vocabulary**, familiarize students with the terms “American landscape,” “department store,” “human social systems,” “landscape,” “lifestyle,” and “suburbs.” Explain that in this lesson, students will consider both meanings of the term “American landscape,” and they will examine how that landscape changed because of mass production and mass consumption. Tell students they will first look at changes to the physical landscape of the United States during the 1920s. They will then consider how U.S. culture and human social systems changed.

#### Step 2

Write “Natural Systems” and “Human Social Systems” on the board. Display the photo card **American Landscape** (Visual Aid #X) and explain that artist Edward Hopper drew this picture titled *American Landscape* in 1920. Ask students, “What do you see in this landscape?” (*Cattle, house, railroad tracks, fields, hills, sky*) Record students’ responses on the board under one of the two categories. Have students determine into which category their response falls.

#### Step 3

Display the photo cards **Carmel River, 1920** (Visual Aid #X) by artist Elizabeth Strong and **Autumn Landscape** (Visual Aid #X) by Ernest Fredericks. Compare and contrast these drawings. Explain that both artists created their paintings in 1920. Highlight the focus on natural systems depicted in these paintings. Ask students the following questions.

- ◆ What would artists today depict as “the American landscape”? (*Skyscrapers, city lights, highways, Grand Canyon, farms*)
- ◆ Would there be more concentration on human social systems or on natural systems? (*Accept any answer.*)

#### Step 4

Project the transparency **Mass Production, Marketing, and Consumption in the Roaring Twenties** (Visual Aid #X). Distribute copies of **Mass Production, Marketing, and Consumption in the Roaring Twenties** (Lesson 4 Activity Master) and have students take out their copies of **Rise of Mass Production and Mass Consumption** (Lesson 2 Activity Master). Explain that the diagram combines the graphics from two previous lessons: **Rise of Mass Production and Mass Consumption** from Lesson 2 and the **Mass Production and Consumption Cycle** from Lesson 3. Note that a component called “Byproducts and Waste” has been added to the **Mass Production and Consumption Cycle**.

Point out to students that mass production and consumption would not have been possible without technology and natural resources. The availability of natural resources combined with new technologies keeps the cycle going.

#### Step 5

Continue to display **Mass Production, Marketing, and Consumption in the Roaring Twenties**. Use **Changing the American Landscape Lecture Notes** (Lesson 4 Activity Master) to give students a brief overview of how mass production, mass consumption, and changes to lifestyles affected the American landscape. Instruct students to take notes on their copies of **Mass Production, Marketing, and Consumption in the Roaring Twenties** as you lecture. If desired, you may fill in the first few notes with students so they understand how to use the



graphic. Refer to the Answer Key and Sample Answers on page xx for help completing the graphic.

### Step 6

When the lecture is finished, display the photo card **Gas, 1940** (Visual Aid #X) and explain that this painting was also made by Edward Hopper, who sketched the first illustration they saw, *American Landscape*. Explain that Hopper was an American realist; his paintings captured views of American life in the early twentieth century. Although painted after the 1920s, this painting depicts some changes in the American landscape that began in the Roaring Twenties.

Ask students, “What changes do you see?” (*More human social systems; gas pump; a person at work; electric lighting.*)

### Step 7

Display again the photo card **American Landscape**. Facilitate a discussion about the differences between Hopper’s two landscape pictures using the following questions.

- ◆ What differences do you see between the two pictures? (*First picture focused more on natural systems; the second focused more on human social systems such as service station with gas pump, electric lighting, buildings, and roads; one looks more like the American landscape today.*)
- ◆ What natural systems do you see in **Gas, 1940**? (*Forest*)
- ◆ What human social systems do you see in **Gas, 1940**? (*filling station, road, electric lights*)
- ◆ Based on these two landscapes, how did the American landscape change during the 1920s and afterward? (*Human social systems replaced natural systems; more roads and cars.*)

### Step 8

Instruct students to use the information presented during class and their notes on the graphic organizer to write a brief essay (2-3 paragraphs) answering the prompt in Part 2 of **Mass Production, Marketing, and Consumption in the Roaring Twenties**.

Collect **Mass Production, Marketing, and Consumption in the Roaring Twenties** for use in assessment.

## Lesson 4—Assessment

### Description

**Mass Production, Marketing, and Consumption in the Roaring Twenties** (Lesson 4 Activity Master) assesses students' achievement of the learning objective: "Describe the direct and indirect influences of growing cities on the American landscape and the associated natural systems." On this activity master, students describe the direct and indirect influences of growing cities on the American landscape and the associated natural systems.

### Suggested Scoring

An Answer Key and Sample Answers for Part 1 of **Mass Production, Marketing, and Consumption in the Roaring Twenties** are provided on pages xx-xx. This is an ungraded activity. Use the **Mass Production, Marketing, and Consumption in the Roaring Twenties Scoring Tool** provided on page xx and the sample provided on page xx to assess students' work. There are 20 total points possible.

### Scoring Tool

#### Answer Key and Sample Answers

**Mass Production, Marketing, and Consumption in the Roaring Twenties** (Lesson 4 Activity Master)

**Design:** The graphic here is a combination of **Rise of Mass Production and Mass Consumption** from Lesson 2 and **Mass Production and Consumption Cycle** from Lesson 3. Please try to make the graphics as similar as possible.

Name: \_\_\_\_\_

### Part 1

**Directions:** As you listen to the lecture, complete the graph showing how the cycle of mass production, marketing, and consumption influenced the American landscape and natural systems. You may use **Rise of Mass Production and Mass Consumption** (Lesson 2 Activity Master) to help you.

#### Science and Events

World War I ended  
Industrial Revolution

leads to...

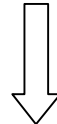


#### New Technology

Many inventions  
Assembly lines  
5-day, 40-hour workweek  
Mechanization  
Cranes for construction

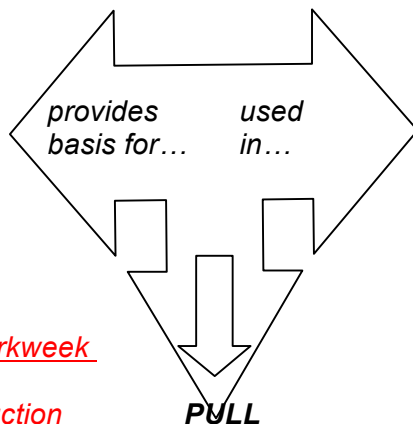
#### Natural Environment

Increased extraction of natural resources:  
oil, natural gas, coal, lumber  
More roads, buildings, and factories built  
extraction of...

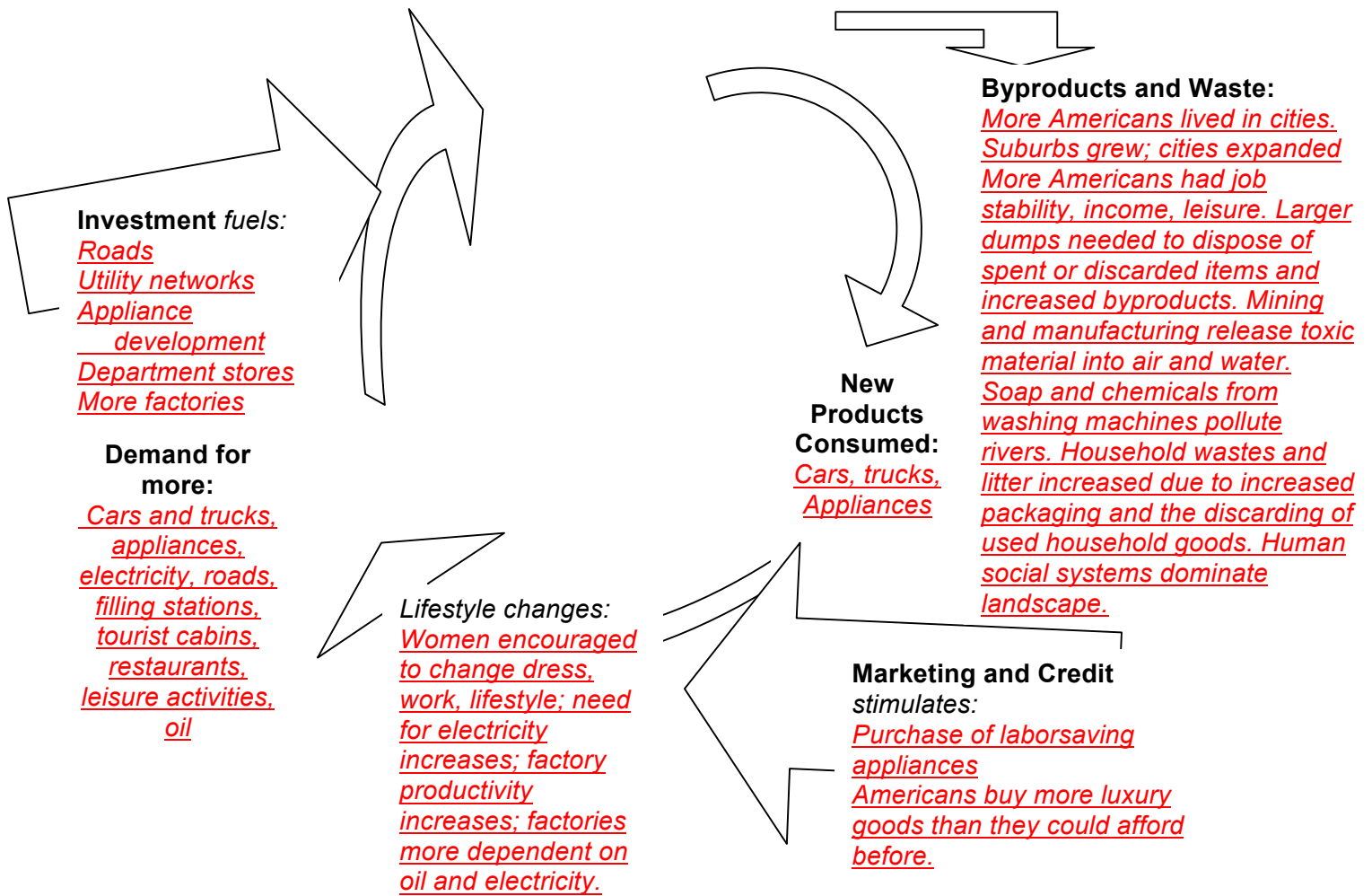


#### Materials and Resources

Oil, steel, glass, rubber  
Oil and natural gas replace coal and water  
as energy sources



New  
Products  
produced: }  
Cars, trucks,  
appliances



## Part 2

**Directions:** Use information from class discussions and the graphic organizer to write a brief essay (2-3 paragraphs) describing the direct and indirect influences of the social, economic, and environmental changes of the 1920s on the American landscape. Include the following points in your essay:

- ◆ Describe the American landscape prior to 1920.
- ◆ Describe influences and features from the growing cities and human social systems that developed in the 1920s.
- ◆ Explain how the features from human social systems directly and indirectly influenced the American landscape and natural systems.

Use the **Mass Production, Marketing, and Consumption in the Roaring Twenties Scoring Tool** to guide your writing.

### Mass Production, Marketing, and Consumption in the Roaring Twenties Scoring Tool

20	Describes several features from natural systems (mountains, rivers, fields, plains); describes influences and features from the growing cities and human social systems that developed in the 1920s (highways, filling stations, roadside restaurants or motels, factories, cars, trucks, cranes, electricity poles/lines, mines, dumps); explains how the features from human social systems directly and indirectly influenced the American landscape and natural systems.
15	Describes one or two features from natural systems; describes one or two influences and features from human social systems that developed in the 1920s; describes how the features from human social systems directly and indirectly influenced the American landscape and natural systems.
10	Identifies a feature from a natural system and a feature from human social systems that developed in the 1920s; describes how the feature from human social systems influenced the American landscape and/or natural systems.
5	Identifies a feature from a natural system or a feature from human social systems that developed in the 1920s.

Social, economic, and physical changes occurred during the 1920s that directly and indirectly influenced the American landscape and natural systems. Events such as World War I and the Industrial Revolution, together with the availability of natural resources, led to the development of many new inventions. These inventions made the lives of Americans easier. For example, the automobile made transportation easier, and vacuums made cleaning homes easier. However, the inventions of the 1920s also changed the social and physical landscape across America.

Before 1920, the American landscape consisted mostly of forests, mountains, rivers, fields, and plains. Farmers used much of the land for agriculture, and cities were located mostly along the coasts and rivers. Land seemed plentiful. Some dirt roads connected cities and farms, but they were not prominent features of the landscape.

During and after the 1920s, the American landscape began to change. People built highways, gas stations, motels, and diners to serve travelers using the many new cars. The number of factories increased in order to produce more goods, and department stores developed to sell the many new products. More jobs were available, and people had more money to spend on goods and homes.

Mass consumption changed the landscape in America as people worked more, consumed more, and advertised more. Advertising encouraged Americans to look better, smell better, and have better lives by using certain products. Human social systems began to dominate the American landscape where natural systems once did. In addition, the mining, logging, and

extraction of natural resources for building and producing goods directly affected natural systems. Consumption indirectly affected natural systems by contributing to air and water pollution, the need for bigger dumps, and changes made to the land.

## **Lesson 4—Activity Masters**

**Mass Production, Marketing, and Consumption in the Roaring Twenties** (Lesson 4 Activity Master)

(See Answer Key)

## **Changing the American Landscape Lecture Notes (Lesson 4 Activity Master)**

### **I. Dramatic Changes in the 1920s**

The 1920s were a period of dramatic changes. World War I had recently ended, and the Industrial Revolution had introduced many new inventions. The nickname “the Roaring Twenties” conveys the excitement over these economic and social changes.

- ◆ More than half of all Americans now lived in cities.
- ◆ The growing affordability of the automobile made people more mobile than ever.
- ◆ The flexibility of the car allowed for the growth of suburbs, which expanded cities throughout the nation.
- ◆ The demand for cars and trucks led to the construction of roads.
- ◆ As roads turned into highways, and highways connected cities across the continent, people wanted convenient roadside filling stations, tourist cabins, and restaurants.

### **II. Economic Boom**

As parts of the economy boomed (e.g., real estate, finance, “high tech”), wages rose for most Americans and prices fell, resulting in a higher standard of living and a great increase in consumer consumption.

- ◆ Advertisements promoted “labor-saving” home appliances to American women.
- ◆ The new mass media, which included radio and motion pictures, encouraged women to change the ways they dressed, worked, and lived. Some say this filled or negated the time saved by “labor-saving” home devices.
- ◆ Many new appliances required electricity, and so electric utility networks began to increase as well. The more electricity used for lighting, heating, cooking, and other household needs, the greater the need for generating and supplying electricity to American homes.

### **III. Automobile Industry Leads Growth of American Economy**

The automobile industry led the growth of the American economy during the 1920s.

- ◆ The number of cars on the road almost tripled between 1920 and 1929, stimulating the production of steel, rubber, plate glass, and other materials that went into making an automobile.
- ◆ Mass production and standardization produced cars more quickly and efficiently, which had a dramatic impact on price. The Model T that sold for \$850 in 1908 sold for \$290 in 1924.
- ◆ Ford created new management techniques designed to build worker loyalty and stunt the development of unions. Ford paid the highest wages in the industry and established the 5-day, 40-hour workweek.
- ◆ Some other companies (not all) followed suit, improving working conditions, offering health insurance and profit-sharing plans, and developing recreational programs. These strategies worked, and workers had job stability, a steady income, and more leisure time than ever before.
- ◆ More Americans could settle into homes, purchase luxury goods, and spend money on leisure activities such as movies, sports, and vacations.

### **IV. Encouraging Mass Consumption**

U.S. industries produced thousands of consumer goods in the 1920s, everything from washing machines to electric razors.

- ◆ Advertising and credit encouraged mass consumption. Advertising created a demand for products, and installment buying, or credit, enabled people to purchase products even if they did not have the cash saved for them.
- ◆ During World War I, the media used advertising to shape public feelings and support for the war efforts.
- ◆ After the war, ad agencies used newspapers, magazines, and radio to affect what people bought.
- ◆ Ads persuaded consumers to buy goods by creating the illusion that love, youth, power, or attraction was available to anyone who bought a certain brand of toothpaste, perfume, or cooking stove.
- ◆ Department stores developed, providing an easy way to shop. Their electric lighting and plate-glass windows displayed a wide variety of goods for sale, encouraging people to buy.
- ◆ The opportunity to buy on credit was also a powerful marketing tool. Businesses enticed consumers to pay a small amount as a down payment and pay off the balance in monthly installments, instead of saving money for an item and purchasing it with cash.
- ◆ As a result, Americans bought many luxury goods. Manufacturing these items required increased amounts of natural resources, more electrical energy to operate these items, and larger dumps to dispose of old items. The number of factories increased.

## **V. Direct Effects on Natural Systems**

The progress of manufacturing and consumption in the 1920s changed the American landscape, which affected natural systems both directly and indirectly. Direct effects included extraction of natural resources, building of roads, buildings, and factories.

- ◆ As cities and suburbs grew, increase in building demanded more lumber.
- ◆ Manufacturers increased the use of nonrenewable natural resources to increase production of goods and operate their factories.
- ◆ During this decade, manufacturers shifted their energy sources from coal and water to oil and natural gas.
- ◆ In 1900, steam provided 80% of the power in manufacturing. By 1920, electricity provided 50%, and by 1929, electricity drove 78% of all manufacturing.
- ◆ The shift from coal and waterpower as energy to the use of oil and natural gas helped to increase the rate of productivity in factories.
- ◆ The demand for petroleum led to oil discoveries in Santa Fe Springs, California, in 1921, as well as Powell, Texas, and Smackover, Arkansas. The supply increased in 1926 and 1928 with new strikes in Oklahoma and Texas.

## **VI. Indirect Effects on Natural Systems**

Indirect effects included the byproducts produced by manufacturing, the disposal of byproducts and used goods, and dependence on machines that required petroleum-based or electrical energy sources.

- ◆ Advances in production required less labor and soon drove down the costs of items. For example, advances in the quality and manufacturing of car tires between 1910 and 1930 drove down the tire costs per thousand miles of driving from \$9.39 to \$.065.
- ◆ Chemical, paper, glass, and food manufacturers all developed rapidly during the 1920s due to technological advances.
- ◆ Mechanization, improved by fuel sources, decreased labor needs and increased productivity.
  - Coal mining increased when companies began to use mechanical loading devices.

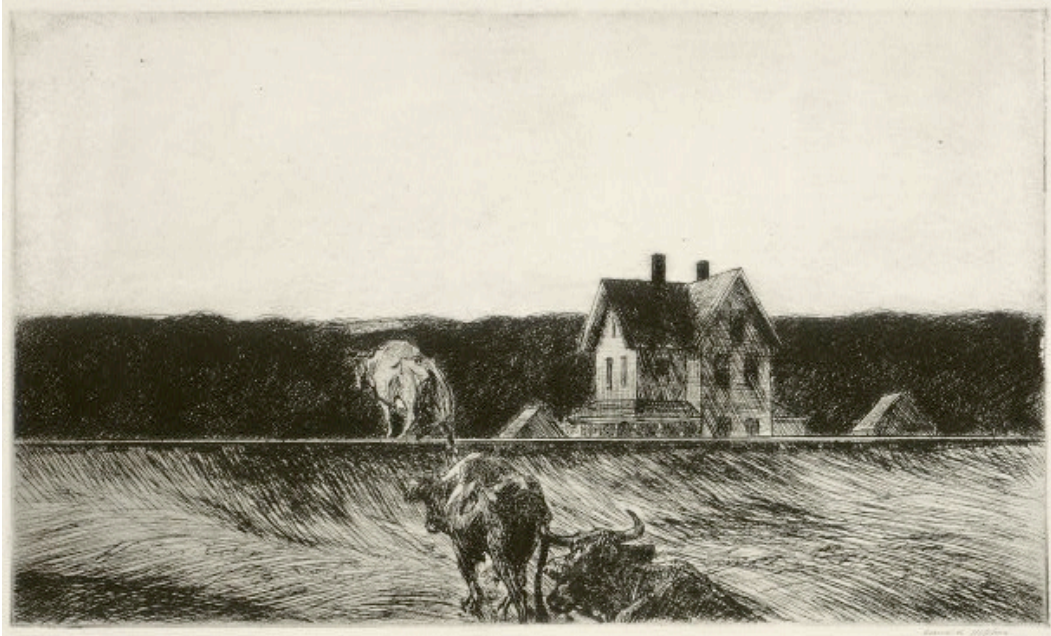


- Electric cranes could lift heavier loads for faster construction of large buildings, including new department stores.
- Machines that mixed materials and smoothed the surface of cement highways made paving roads easier.
- ◆ As prices fell and sales increased, manufacturing increased, generating more byproducts.
  - Byproducts and used household products required disposal in larger and larger amounts.
  - Mining and manufacturing released toxins into the air and water.
  - Soap and chemicals from washing machines polluted rivers.
  - Household wastes increased due to increased packaging and the discarding of used household goods.
- ◆ In the 1920s, a land disposal technology developed that was a precursor to modern sanitary landfills. It combined filling and open dumping but paid more attention to the “sanitary” aspect by covering waste with dirt and sometimes spraying to eliminate the problem of rotting organic materials. The modern sanitary landfill developed between the end of World War II and the 1980s.

#### Lesson 4—Visual Aids

**American Landscape** (Visual Aid #X)

**Design:** Create as a photo card



[http://www.starr-art.com/exhibits/Edward\\_Hopper\\_Etchings/Edward\\_Hopper\\_Etchings\\_scroll.html](http://www.starr-art.com/exhibits/Edward_Hopper_Etchings/Edward_Hopper_Etchings_scroll.html)

<http://www.nga.gov/cgi-bin/pimage?57192+0+0>

**Carmel River, 1920** (Visual Aid #X)

**Design:** Create as a photo card. If these landscapes are not available for use, please find similar landscape paintings from the 1920s depicting primarily natural features



[http://www.askart.com/AskART/assets/member/130/130830/7802\\_70043\\_CarmelRiver1920.jpg](http://www.askart.com/AskART/assets/member/130/130830/7802_70043_CarmelRiver1920.jpg)

**Autumn Landscape, 1920** (Visual Aid #X)  
**Design:** Create as a photo card



<http://www.treadwaygallery.com/ONLINECATALOGS/MAY2006/catalog5-06/weblarge/0714.jpg>

**Gas, 1940** (Visual Aid #X)

**Design:** Create as a photo card



<http://www.paintinghere.com/uploadpic/edward%20hopper/big/Gas.jpg>

**Mass Production, Marketing, and Consumption in the Roaring Twenties** (Visual Aid #X)

**Design:** Create as a transparency exactly like student Activity Master of the same title, but without the answers.

## Lesson 5

### Lesson Title

Managing the Consequences

### Introduction

In this lesson, students explore the relationships among science and technology, natural systems, mass production, and mass consumption. They examine the byproducts of these relationships and their effects on natural systems by reviewing information presented in ***California Connections: California's Tire Problem***. To reinforce understanding of the cycle of mass production and consumption and its effects on natural systems, students brainstorm a list of familiar goods that fit into the cycle. The class then focuses on one ubiquitous mass-produced product—the plastic shopping bag. While listening to a lecture about the development and use of plastic bags, students make notes on a blank copy of the graphic organizer presented in the previous lesson. Working in small groups, students discuss questions related to the effects of plastic bags on natural systems and propose possible alternatives. Students then write responses to these questions, describing the effects that changes may have on the cycle of mass production and consumption.

### Background

Hair dryers, Band-Aids, toasters, and radios... the 1920s ushered in an era of mass production of goods designed to meet the needs and wants of the growing middle class in the United States. With mass production came mass consumption and the development of a cycle that laid a foundation for a society of consumerism. Henry Ford made the automobile affordable through mass production and attractive to consumers through marketing, and other car manufacturers followed suit. Ever since, the world has consumed great numbers of cars. One result of this mass consumption has been the byproduct of worn tires tossed into dumps and, more recently, recycling efforts to retread and reuse old tires. What about the thousands of other mass-produced products that have affected natural systems through natural resource extraction and waste disposal?

Today, almost 90 percent of floating marine debris is plastic. Due to its durability, buoyancy, and ability to absorb and concentrate toxins present in the ocean, plastic is especially harmful to marine life. The National Marine Debris Monitoring Program has gathered data for debris from a variety of sources. Their results showed that the top debris items included: plastic bags with seams, plastic beverage bottles, and other plastic bottles. A single one-liter bottle can break down into enough small fragments to put one on every mile of beach in the entire world. These smaller particles are joined by the small pellets of plastic which are the form in which many new plastics are marketed and which can be lost at sea by the drumload or even a whole container load. These modern day accumulations of plastic are often collected from beaches by environmental volunteers.

A common and controversial product is the plastic shopping bag, usually made from polyethylene. Polyethylene is a thermoplastic, a byproduct of petroleum or natural gas that melts to liquid when heated. Different processes can produce different densities of polyethylene. Although polyethylene can be recycled, most of it ends up in landfills and oceans. It is not considered biodegradable because it takes several centuries to degrade. Americans discard an estimated 100 billion polyethylene plastic bags each year, recycling as little as 1% of them.

Returning to paper bags is expensive, both financially and environmentally. Producing paper consumes natural resources, generates harmful byproducts, and requires more fossil fuels to produce and transport than plastics. To produce one plastic bag costs about two cents, while paper bags cost about four cents. Alternatives, called bioplastic bags, can be made from natural starches (for example, corn, potato, or cassava) or vegetable oils at a cost of seven or eight

cents per bag. Using bioplastic bags would raise the overall costs for businesses and consumers. In addition, it is unclear how durable and biodegradable the bioplastics are.

### **EEl Learning Objectives**

Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems.

Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials).

### **Key Vocabulary**

**Biodegradable:** (noun) That which can be decomposed by microorganisms such as bacteria; apple cores are biodegradable while polyethylene bags are not. (adjective) Having the capacity to be decomposed by microorganisms.

**Plastic:** Any of various organic compounds produced by polymerization that are capable of being molded, extruded, cast into various shapes and films, or drawn into filaments used as textile fibers.



## Lesson 5—Toolbox

### Summary of Activities

Students review ***California Connections: California's Tire Problem*** and brainstorm mass-produced goods in use today. After completing a chart applying the cycle of mass production and consumption to plastic bags, they discuss and write about the effects of plastic bags on natural systems.

### Instructional Support

See Extensions & Unit Resources, **pages xx-xx**.

### Prerequisite Knowledge

#### Students should know about:

- ◆ transformations of the U.S. economy and the changing social and political conditions in the United States in response to the Industrial Revolution.
- ◆ the connections among natural resources, entrepreneurship, labor, and capital in an industrial economy.

#### Students should be able to:

- ◆ interpret charts and graphic organizers.
- ◆ take lecture notes.
- ◆ summarize ideas in a written response.

### Advanced Preparation

#### Gather and prepare Activity Masters:

- ◆ gather from previous lessons:
  - **Mass Production, Marketing, and Consumption in the Roaring Twenties** from Lesson 4.

#### Gather and prepare Materials Needed.

#### Gather and prepare Visual Aids:

- ◆ prepare transparencies.
- ◆ gather from previous lessons:
  - **Mass Production, Marketing, and Consumption in the Roaring Twenties**, Visual Aid **#X**

### Materials Needed

#### A-V Equipment:

- ◆ overhead or LCD projector, screen

#### Class Supplies:

- ◆ binder paper, chalk or dry-erase markers, pens or pencils

### Visual Aids

#### Transparencies:

- ◆ **Plastic Pollution in the Marine Environment**, Visual Aid **#X**
- ◆ **White Pollution in Beijing Market**, Visual Aid **#X**

- ◆ **Plastic Bag or Jellyfish?** Visual Aid #X
- ◆ **Pacific Garbage Patch,** Visual Aid #X
- ◆ **Mass Production, Marketing, and Consumption of Plastic Shopping Bags,** Visual Aid #X
- ◆ **Mass Production, Marketing, and Consumption of Plastic Shopping Bags Answer Key,** Visual Aid #X

### **Activity Masters**

#### **Plastic Bags Lecture Notes**

SM, Pages xx-xx

One per class

#### **Mass Production, Marketing, and Consumption of Plastic Shopping Bags**

SM, Pages xx-xx

One per student

### **Preparation Time**

10 min.

### **Instructional Time**

55 min.

### **Safety Notes**

None

## Lesson 5—Procedures

### Vocabulary Development

Use the **Key Unit Vocabulary** (Lesson 1 Activity Master) to introduce new words to students as appropriate.

#### Step 1

Distribute students' copies of **Mass Production, Marketing, and Consumption in the Roaring Twenties** (Lesson 4 Activity Master). Project the transparency **Mass Production, Marketing, and Consumption in the Roaring Twenties** (Visual Aid #X). Review the flow of the diagram with students and answer any questions. Remind students that as long as technology and natural resources supply this cycle, it will continue to generate more products, more byproducts, more waste, and more consumption.

#### Step 2

Remind students of **California Connections: California's Tire Problem** (Lesson 1 Activity Master), which they read in Lesson 1, and ask them the following questions.

- ◆ Where do car tires fit in the cycle of mass production, marketing, and consumption? *(Cars were invented; the assembly line increased production; natural resources such as rubber and petroleum were extracted from natural systems; tires were made from natural resource-based materials; cars were mass-produced and costs decreased; consumers purchased more cars; tires on cars wore out; old tires were discarded; demand for tires increased; manufacturers made more tires; investment and science found ways to make better tires; people continued to purchase cars and tires; cycle continued.)*
- ◆ How are government and business addressing the problem of discarded car tires? *(The California Integrated Waste Management Board [CIWMB] provides incentives for finding new ways to recycle or reuse tires; government oversees tire dump sites; government cleans up old dump sites; businesses find ways to reuse old tires, such as retreading them or using shredded tire rubber for playgrounds, building, and roads.)*

#### Step 3

Ask students to think of products they use today that fit into the mass production, marketing, and consumption cycle. Divide students into pairs or small groups, and instruct them to brainstorm and list as many items as they can think of that fit into this cycle. *(Plastic water bottles, soda cans, Styrofoam containers, paper napkins, shopping bags, books, magazines, MP3 players, compact disks, computers, DVDs, writing paper, shoes, T-shirts, toothpaste, hair products, liquid soap)* Have students share their lists with the class. Ask if anyone put plastic grocery bags on their list.

#### Step 4

Ask students to share what they know about plastic shopping bags. *(Used in most grocery stores; provide option to paper bags; may be reused or recycled; litter the environment.)*

Explain that the development and use of plastic became popular after World War I when petroleum became more readily available and more frequently used in manufacturing. Today, businesses, governments, and citizens around the world debate the costs and benefits of plastic shopping bags. Like car tires that have filled dump sites, plastic shopping bags are harmful litter. They cause damage on land, in the ocean, and in landfills.

#### Step 5

Distribute copies of **Mass Production, Marketing, and Consumption of Plastic Shopping Bags** (Lesson 5 Activity Master), and instruct students to take notes on Part 1 of the diagram

while listening to the lecture you will be giving. Refer to **Mass Production, Marketing, and Consumption of Plastic Shopping Bags Answer Key** (Visual Aid #X) to assist students in completing their diagram. Encourage students to use their copy of **Mass Production, Marketing, and Consumption in the Roaring Twenties** for additional help.

#### **Step 6**

Using **Plastic Bags Lecture Notes** (Lesson 5 Activity Master), give students a brief overview of how mass production, mass consumption, and changes to lifestyles contributed to the development and use of plastic bags and affected the American landscape.

When you have completed the lecture, project **Mass Production, Marketing, and Consumption of Plastic Shopping Bags Answer Key** (Visual Aid #X) and review it with students.

#### **Step 7**

Organize students into pairs or small groups and have them discuss the questions in Part 2 of **Mass Production, Marketing, and Consumption of Plastic Shopping Bags**. Instruct students to each write their answers on **Mass Production, Marketing, and Consumption of Plastic Shopping Bags**.

When groups have finished answering the questions, discuss their responses. See the Answer Key and Sample Answers on page xx to help lead the discussion.

Collect **Mass Production, Marketing, and Consumption of Plastic Shopping Bags** for use in assessment.

## Lesson 5—Assessment

### Description

**Mass Production, Marketing, and Consumption of Plastic Shopping Bags** (Lesson 5 Activity Master) assesses students' achievement of the learning objectives: "Identify the relationship between mass production techniques and the consumption of natural resources; the rates of consumption of manufactured goods; and the production of byproducts that may have detrimental, beneficial, or neutral effects on natural systems;" and "Provide examples of the direct and indirect effects of new technologies (for example, automobiles, electricity) on natural systems (for example, consumption of land for transportation systems, release of toxic and nontoxic byproducts and waste materials)." On this activity master, students identify the relationship between the rise of mass production and consumption and the creation of byproducts that affect the environment. They also provide examples of the direct and indirect effects of new technologies on natural systems.

### Suggested Scoring

Use the Part 1 of the **Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool** provided on page xx and the sample provided on page xx to assess students' work. There are 20 total points possible.

Use the Part 2 of the **Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool** provided on page xx and the sample provided on page xx to assess students' work. There are 12 total points possible.

## Answer Key and Sample Answers

### Mass Production, Marketing, and Consumption of Plastic Shopping Bags (Lesson 5 Activity Master)

Design: This graphic has the same design as **Mass Production, Marketing, and Consumption in the Roaring Twenties** from Lesson 4, but different answers.

Name: \_\_\_\_\_

#### Part 1

**Directions:** Complete the graph showing the cycle of mass production, marketing, and consumption of plastic shopping bags.

Use **Part 1 of the Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool** to guide your work.

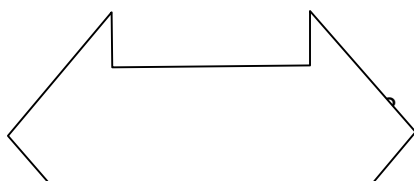
#### Part 1: Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool

20	Student accurately identifies all of the following: <ul style="list-style-type: none"><li>the events and science that led to plastic bag development</li><li>natural resources used to make plastic bags</li><li>three main parts of the cycle (bags produced, consumed, demand for more)</li><li>byproducts and/or waste from production and consumption</li><li>marketing and credit and/or investment in bags</li></ul>
15	Student accurately identifies three of the following: <ul style="list-style-type: none"><li>the events and science that led to plastic bag development</li><li>natural resources used to make plastic bags</li><li>three main parts of the cycle (bags produced, consumed, demand for more)</li><li>byproducts and/or waste from production and consumption</li><li>marketing and credit and/or investment in bags</li></ul>
10	Student accurately identifies two of the following: <ul style="list-style-type: none"><li>the events and science that led to plastic bag development</li><li>natural resources used to make plastic bags</li><li>three main parts of the cycle (bags produced, consumed, demand for more)</li><li>byproducts and/or waste from production and consumption</li><li>marketing and credit and/or investment in bags</li></ul>
5	Student accurately identifies one of the following: <ul style="list-style-type: none"><li>the events and science that led to plastic bag development</li><li>natural resources used to make plastic bags</li><li>three main parts of the cycle (bags produced, consumed, demand for more)</li><li>byproducts and/or waste from production and consumption</li><li>marketing and credit and/or investment in bags</li></ul>

#### Science and Events

Plastic developed  
Convenience and cost  
of paper bags high

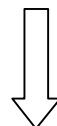
leads to...



#### Natural Environment

Oil and natural gas taken from ground  
Oil transported overland by road, pipeline,  
or by water on tanker ships

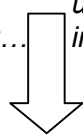
extraction of...



### New Technology

Plastic bags  
designed; more  
convenient, less  
cost to manufacture;  
less landfill space needed

provides basis for... used in...



PULL

### Materials and Resources

Polyethylene from  
petroleum and natural gas

### New Products produced:

Plastic shopping bags

### Byproducts and Waste:

Fuel burned to pump,  
transport, refine oil, heat  
polyethylene, and make bags  
Non-biodegradable polymer  
pieces as white pollution;  
bags litter ocean and land;  
disposal into landfills; harm  
animals

**Investment fuels:**  
new ways to make  
bags

**Demand for more:** plastic bags

**Lifestyle changes:**  
People and businesses  
become dependent  
on plastic

**New Products Consumed:**  
Plastic Shopping Bags

**Marketing and Credit:**  
increased purchases of  
consumer goods increases

## Part 2

**Directions:** Discuss each question with your partner or group, and write your answer

Use **Part 2 of the Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool** to guide your writing.

### Part 2: Mass Production, Marketing, and Consumption of Plastic Shopping Bags Scoring Tool

4	Student provides a complete and reasonable response. Accurate details from lecture and prior knowledge support response.
3	Student provides a reasonable response. Details support response.
2	Student provides a reasonable response. Minimal details support response.
1	Student attempts to respond to question. Details do not appropriately support response.

1. How does the production of plastic shopping bags affect natural systems? (4 points)

The production of plastic shopping harms natural systems. Nonrenewable natural resources—oil and natural gas—are used to manufacture these bags, and these resources are in short supply. In addition, discarded bags become litter on the land and in the ocean. Plastic bags have harmed many marine animals. Millions of these bags occupy landfill space after only being used once or twice. As consumers use more bags each day, manufacturers make more to replace those that have been thrown away.

or

The production of plastic shopping bags is beneficial to natural systems. Plastic bags replaced paper bags that were used to carry groceries and other consumer goods. Paper bags are made from trees, which are in short supply and must be protected. Plastic bags are less expensive and use far less energy to produce and recycle than paper bags. In addition, they are reusable and more convenient than paper bags, which tend to tear. Finally, when plastic bags are disposed of in landfills, they take up less space than paper bags do.

2. What might be done to change the cycle of mass production, marketing, and consumption of plastic bags? (4 points)

New technologies could find a way to recycle disposed of materials in an inexpensive manner to create sturdy, affordable, convenient bags for consumers to use instead of plastic shopping bags. This way, natural systems would benefit from capturing and reusing discarded materials that might otherwise go into landfills. In addition, oil and natural gas would no longer be needed for making plastic shopping bags. Marketing efforts could present these reusable bags as the best thing since sliced bread and create an illusion that recycled-material bags are all the rage as well as the solution for future generations. Consumers can be convinced that plastic shopping bags are “uncool” and that these new bags are the way to live a better life. The new bags would be designed to last a lifetime, so fewer bags would need to be made, and there would be less waste from their disposal.

3. What can the government do to manage concerns about plastic bags via regulation, incentives, and/or new technologies? (4 points)

Local, state, and/or federal government officials might offer incentives, such as research grants, to scientists and entrepreneurs to develop alternatives to the plastic shopping bag. Regulations could be developed to limit the number of bags allowed to each consumer during a span of time.



For example, consumers might be issued five bags every year. During the remainder of the year, bags would not be available. People who use too many bags or who litter could be fined. The funds collected could be used to clean up the Great Pacific Garbage Patch, rescue animals that have swallowed plastics, improve landfills, etc. The government could also make funds available to educate consumers and businesses about the environmental concerns of plastic bags.

## Lesson 5—Activity Masters

### Plastic Bags Lecture Notes (Lesson 5 Activity Master)

#### I. Plastic is Introduced

Alexander Parkes introduced plastic in 1862. In 1909, Leo H. Baekeland coined the word "plastic" to describe a new class of materials that included "bakelite," a substance he created from coal tar. (Coal tar is a byproduct produced when coal is carbonized to make coke or gasified to make coal gas).

- ◆ Bakelite was used to produce many items, including telephones, cameras, and even ashtrays.
- ◆ Plastic did not become popular until after World War I, when petroleum became readily available. Petroleum can be more easily processed than coal.
- ◆ Petroleum and natural gas are the primary sources of the key ingredients in plastic.
- ◆ Plastics are composed of polymers, which are large molecules consisting of repeating units called monomers. In plastic bags, the repeating units are ethylene, or ethene. Plastic shopping bags are made from high-density polyethylene (HDPE). Besides these polymers, some lubricant and possibly pigments for color are added to make plastic bags.
- ◆ To make bags, oil is pumped from the ground, transported to a refinery, and converted into pellets. A component of oil, called polyethylene, is heated and used to form the plastic material from which bags are cut. All of these steps require energy sources.

#### II. Plastic Shopping Bags

Polyethylene was first used to make plastic shopping bags in 1977, but it was not until 1982 that people started relying on plastic shopping bags for their groceries and other purchases.

- ◆ Large grocery companies started replacing paper bags with more convenient and affordable plastic bags.
- ◆ Plastic bags require 70% less energy to make than paper bags, take less energy to recycle, and take up less space in landfills than paper bags.
- ◆ Many people reuse plastic shopping bags for trash disposal, lunch bags, and pet pick-up.
- ◆ Five hundred billion to 1 trillion plastic bags are used worldwide every year.
- ◆ Businesses have come to rely on these inexpensive resources to support consumer buying.
  - "Free bags to carry away all of your purchases from our stores! The more you consume, the more bags we will make available."
  - Some businesses developed their own bags for marketing and advertisement.
- ◆ Consumers have come to depend on plastic shopping bags for convenience and to support current lifestyles.

#### III. Problems with Plastic Shopping Bags

Plastic shopping bags have become litter on land and in the ocean.

(Note: Project the transparencies **Pollution in the Marine Environment** and **White Pollution in Beijing Market** [Visual Aids #X-x].)

- ◆ In China, plastic bags blowing around the streets are called "white pollution."
- ◆ People in South Africa used to joke that the plastic bag was their "national flower" before banning plastic bags in 2003.

(Note: Project the transparency **Plastic Bag or Jellyfish?** [Visual Aid #X].)

- ◆ Sea turtles, birds, whales, and other marine animals have eaten bags floating in the water, suffering harm and often death.

(Note: Project the transparency **Pacific Garbage Patch** [Visual Aid #X].)

- ◆ The “Great Pacific Garbage Patch” is an area of marine debris in the North Pacific off the western coast of North America.
- ◆ This patch is a whirling mass of water that sucks everything near it toward its center. It contains large amounts of suspended plastic and other debris trapped by the ocean currents.
- ◆ The patch is called a “plastic stew” and is estimated to be twice the size of the state of Texas.
- ◆ The polymer pieces in plastic bags are not biodegradable. The bag may break into pieces, but the pieces still exist as plastic.
- ◆ Studies of the seafloor in the northwestern Mediterranean found that plastics made up 77% of the debris on the seafloor. Of this, 93% were plastic bags.
- ◆ Citing environmental reasons, several countries have banned or discouraged the use of plastic shopping bags, including Australia, China, Bangladesh, South Africa, Rwanda, Italy, Ireland, Mumbai, and India.
- ◆ In 2007, the city of San Francisco banned the use of plastic shopping bags in large supermarkets and retail pharmacy chains. This law has eliminated the use of an estimated five million plastic bags each month.

## Lesson 5—Visual Aids

### Plastic Pollution in the Marine Environment (Visual Aid #X)

**Design:** Create as a transparency.

<http://www.plasticdebris.org/>



### White Pollution in Beijing Market (Visual Aid #X)

**Design:** Create as a transparency.



<http://news.nationalgeographic.com/news/bigphotos/74875718.html>

**Plastic Bag or Jellyfish?** (Visual Aid #X)

**Design:** Create as a transparency.



[http://www.cdninfo/news/eco/plastic\\_pollution\\_250252.jpg](http://www.cdninfo/news/eco/plastic_pollution_250252.jpg)

**Pacific Garbage Patch** (Visual Aid #X)

**Design:** Create as a transparency.



[http://www.bestlifeonline.com/cms/uploads/1/captain\\_plastic\\_1.jpg](http://www.bestlifeonline.com/cms/uploads/1/captain_plastic_1.jpg)

[http://images.google.com/imgres?imgurl=http://www.bestlifeonline.com/cms/uploads/1/captain\\_plastic\\_1.jpg&imgrefurl=http://uhgradgd.blogspot.com/2008/02/eastern-garbage-patch.html&usq=V5jhxmmpmDAAQsYhwUf\\_g-3H5C8=&h=339&w=260&sz=15&hl=en&start=77&um=1&tbnid=dFa6qkCffwbwZM:&tbnh=119&tbnw=91&prev=/images%3Fq%3Dplastic%2Bvortex%26start%3D60%26ndsp%3D20%26um%3D1%26hl%3Den%26client%3Dsafari%26rls%3Den-us%26sa%3DN](http://images.google.com/imgres?imgurl=http://www.bestlifeonline.com/cms/uploads/1/captain_plastic_1.jpg&imgrefurl=http://uhgradgd.blogspot.com/2008/02/eastern-garbage-patch.html&usq=V5jhxmmpmDAAQsYhwUf_g-3H5C8=&h=339&w=260&sz=15&hl=en&start=77&um=1&tbnid=dFa6qkCffwbwZM:&tbnh=119&tbnw=91&prev=/images%3Fq%3Dplastic%2Bvortex%26start%3D60%26ndsp%3D20%26um%3D1%26hl%3Den%26client%3Dsafari%26rls%3Den-us%26sa%3DN)

**Mass Production, Marketing, and Consumption of Plastic Shopping Bags Answer Key**  
(Visual Aid #X)

Design: This should be a transparency of Part 1 of the Answer Key and Sample Answers of **Mass Production, Marketing, and Consumption of Plastic Shopping Bags**, as found in the Assessment for this lesson. Please include answers on transparency.